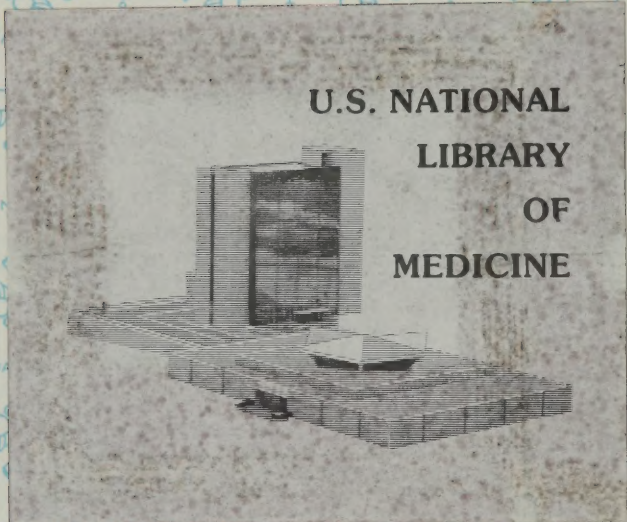




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MAJ. GEN. MERRITTE W. IRELAND, M. C., CHIEF SURGEON, A. E. F., MAY 1, 1918,
TO OCTOBER 9, 1918

The
MEDICAL DEPARTMENT
OF THE UNITED STATES ARMY
IN THE WORLD WAR

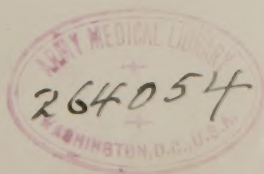
VOLUME II
ADMINISTRATION
AMERICAN
EXPEDITIONARY
FORCES

PREPARED UNDER THE DIRECTION OF
MAJ. GEN. M. W. IRELAND
The Surgeon General

By
COLONEL JOSEPH H. FORD, M. C.



UNITED STATES GOVERNMENT PRINTING OFFICE : 1927



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LETTER OF TRANSMISSION

I have the honor to submit herewith a portion of the history of the MEDICAL DEPARTMENT OF THE UNITED STATES ARMY IN THE WORLD WAR. The portion submitted is Volume II, and is entitled "ADMINISTRATION, AMERICAN EXPEDITIONARY FORCES."

M. W. IRELAND,
Major General, the Surgeon General.

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PREFACE ^a

This volume considers only the more important administrative activities of the Medical Department in the American Expeditionary Forces, for the scope of these and their ramifications were such as to preclude, in the space available, a more thorough discussion. On the other hand, since there is a degree of overlapping of this and other volumes, for example, Volumes VI and VIII, certain administrative matters already covered in these other volumes are not taken up in detail herein. Thus the administrative matters which related to the evacuation service of the Medical Department at the front are considered in Volume VIII; the administrative matters closely connected with sanitation will be found in Volume VI. The purely professional services, though covered briefly in this volume, have been assigned greater space in volumes appropriate to each subject. The fact that the service of but one hospital center is discussed at some length, though such formations were among the most important of the Medical Department enterprises, illustrates the necessity for compressing the material available.

Certain subjects and activities may seemingly have been unduly slighted. This has been due, on the one hand, to the necessity to avoid unnecessary duplication, or, on the other hand, to the fact that official reports concerning the subjects in question were too fragmentary. Thus, to the chief surgeon's office, line of communications, the chief surgeon's office, American forces in France, and the medical activities of some of the sections of the Services of Supply it has been impossible to give the consideration which their importance warrants.

Acknowledgment is made to Lieut. Frank Steiner, M. A. C., for arranging the chapters on the brief histories of hospital centers, base, and camp hospitals.

^a For the purpose of the history of the Medical Department of the United States Army in the World War, the period of war activities extends from April 6, 1917, to December 31, 1919. In the professional volumes, however, in which are recorded the medical and surgical aspects of the conflict, as applied to the actual care of the sick and wounded, this period is extended, in some instances, to the time of the completion of the history of the given service. In this way only can the results be followed to their logical conclusion.

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INTRODUCTION

MILITARY ATTACHÉS AND OBSERVERS, MEDICAL OFFICERS WITH SPECIAL DUTIES, HOSPITAL UNITS AND CASUAL PERSONNEL ON DUTY WITH ALLIES

MILITARY ATTACHÉS AND MILITARY OBSERVERS

When war was declared by Germany on July 30, 1914, there were on duty with the principal American embassies and ministries accredited to European governments military attachés who were charged with the duty of procuring and forwarding military information to the chief of the War College division of the Army General Staff.¹ In some countries their efforts were supplemented later by those of military observers—officers who occupied a status somewhat different from that of attachés but who, like them, were assigned to duty with the respective embassies and accredited to the governments concerned.² Generally speaking, the observers enjoyed greater opportunities for investigations at the front than did the attachés, for they were assigned, as their designation would indicate, with that end in view, though in some instances the opportunities afforded them were strictly limited by the government to which they were accredited.³ Though the military attachés were the military advisers of the ambassadors under whom they served, and were charged more definitely with reporting to the Army War College current military events and military policies in so far as these were divulged,⁴ they also submitted many reports covering a wide range of other subjects.

On August 12, 1914, the Secretary of War requested the Secretary of State to learn whether or not England, France, Germany, and Austria would accept as observers six officers of the line and two of the Medical Department.⁵ The Secretary of War was notified, on August 17, that the Austro-Hungarian Government was willing to accept two line officers and two medical officers.⁶ Later this authorization was so modified as to replace one medical officer by another officer from a different branch of the service.⁷ On August 19 the military attaché in London notified the War College division of the General Staff that two military observers, in addition to the military attachés, would be permitted to accompany the British Army in the field.⁸

The Chief of Staff informed the Surgeon General, on August 12, 1914, that medical officers who might be detailed as observers should be governed by General Orders, No. 60, War Department, August 8, 1914, which requested and advised all officers to refrain from public comment upon the military or political situation where other nations were involved.⁹

On September 1, 1914, an officer of the Medical Corps, then in Europe, together with three officers from other branches of the Army, was directed to report to the American ambassador in Vienna for duty as military observer with the Austro-Hungarian Army.¹⁰ He served in this capacity at various places along the Russian and Serbian fronts until October 27, 1915.¹¹

On September 9, 1914, another officer of the Medical Corps, then in London, was assigned as military observer with the French Army,¹² and served in that capacity until November 23 of that year.¹³

On January 30, 1916, Sir William Osler, regius professor of medicine, Oxford University, England, recommended that three medical officers of our Army and an equal number of our Navy be detailed to study professional procedures in British base hospitals.¹⁴ The recommendation, having been referred to him, the Surgeon General, on March 6, 1916,¹⁵ selected three members of the Medical Corps, who were then assigned and accredited as military observers.¹⁶ After reporting in London in May, these officers made extensive observations in matters pertaining to the British medical service both in England and on the continent.

No officer of the Medical Corps was a member of the group assigned as military observers with the German Army.¹⁷

The medical officers assigned as military observers with the British Army remained in this status until the arrival of General Pershing in June, 1917,¹⁸ when they vacated their assignments and joined the American Expeditionary Forces,¹⁹ except one, who retained his status as observer and his consequent affiliation with the American Embassy,²⁰ on June 9, 1917, in addition to his other duties, being made liaison officer for our Medical Department with the British forces, with office in London.²¹ Shortly thereafter he was assigned as chief surgeon of the American forces serving with the British, his status in this matter being analogous to that of a department surgeon in the United States.²²

Another of these medical officers, after joining the American Expeditionary Forces,²³ was assigned, on July 4, to duty at Base Section No. 1 (St. Nazaire), where he had been conducting an inspection when headquarters, A. E. F., arrived;²⁴ the third or senior medical officer became chief surgeon, A. E. F., on May 26, 1917, by General Orders, No. 1, headquarters, A. E. F., Washington, D. C.

Meanwhile, on February 23, 1917, the British had recommended that a veterinary officer of the United States Army be detailed to observe the operations of his branch of the service in their army.²⁵ Accordingly, a veterinarian attached to the 6th Field Artillery, who had been assigned as a military observer with the French Army, December 27, 1915,²⁶ was relieved from further duty in France on March 10, 1917, and directed to report to the American ambassador at London for the purpose of carrying out instructions of the War Department.²⁷ On June 14, 1917, this officer was relieved from further duty in London ordered to Paris, and assigned to duty in the American Expeditionary Forces.²⁸

These several observers with the British Army submitted numerous reports many of which were very thorough and elaborate, and all of which were technical, concerning organization, administration, equipment, and tactics of the British Army medical service, sanitation, preventive and curative medicine, surgical and orthopedic technique, offensive and defensive measures in gas warfare, transportation of wounded, care of animals, and many other subjects. A few of their reports pertained to the British Navy; e. g., hospital ships.

On June 5, 1915, the chief of the War College division of the General Staff approved and forwarded to the Surgeon General a letter from the Amer-

ican military attaché, Paris, requesting detail of a medical officer as an observer with the French Army.²⁹ On June 12, the Surgeon General, concurring in this proposal, recommended a medical officer,³⁰ who was assigned on November 15, 1915, as military observer with the French armies in the field.³¹

In conformity with a request from the German Government dated September 1, 1916, that two medical officers of the United States Army be detailed to inspect depots for prisoners of war in France,³² the Surgeon General, on September 12, recommended that a medical officer be assigned to that duty to supplement the activities of the one who already was available for that service.³³ On September 25, 1916, the newly assigned medical officer was detailed as a military observer.³⁴ This was not in order that he might perform the functions of an officer regularly so accredited, but in order that his status might be fixed while on detached duty, and that he might receive an allotment from the appropriation for military observers abroad.³⁵ The primary purpose in sending him to France was that he might assist in the inspection of depots for military prisoners, but in point of fact he not only did this but also made a number of such observations as were regularly incumbent upon a military observer.³⁵

In addition to the two medical officers referred to above other officers belonging to different branches of our Army were serving as military observers accredited to the French Government.³⁶ On July 19, 1916, six of these officers joined in signing a letter addressed to the chief of the War College division, General Staff, recommending that they be organized into a mission.³⁶ This letter noted the advantages that would accrue from the recognition of an American military mission by the French War Department and stated that they were all recognized as being members of such a group but that they had no designated head who could represent them in their transactions with the French Government.³⁶

The mission was organized by authority of the following letter of November 21, 1916, from the acting chief of the War College division, General Staff:³⁷

By authority of the Secretary of War, the officers now on duty in Paris as military observers have been organized into a mission of which you are hereby appointed chief.

The Secretary of War directs that in the performance of your duties as chief of this mission you be guided by the following instructions:

(a) You will cooperate in the fullest possible manner with the military attaché at Paris in the work of procuring military information, to the end that there be no duplication of work.

(b) You will show to the military attaché all reports of the military observers prepared for transmittal to the War College division. Such reports will be numbered serially in the office of the military observers in such a manner that they will not be confused with the numbered reports of the military attaché. Reports of the military observers will be acknowledged by the War College division directly to the chief of the military mission once a month.

(c) All requests from the War College division for information to be compiled by the military observers will be directed to you, and it will be your duty to inform the other military observers of the information that is desired.

(d) All the arrangements between the office of military observers covering all questions or requests will be carried on directly between you as chief of the mission and the military attaché.

(e) The retained reports of the individual military observers will be accessible at all times to the military attaché, and conversely all reports of the military attaché covering matters of routine military interest will be open to the military observers.

(f) As chief of this mission you are authorized to communicate directly with the French War Department to such an extent as may be permitted by the latter department. You will, however, keep the military attaché informed of such matters as are taken up directly by you with the French War Department.

(g) In order that the greatest possible advantage may be taken of all possible channels to procure military information, you are directed to cooperate to the fullest extent with the military attaché.

(h) Instructions have been issued to the military attaché at Paris to officially present you to the chief of the second bureau of the French General Staff as chief of the American military mission upon the receipt of the acknowledgment by the French authorities of your assignment as such, which is being communicated to them through the Department of State.

(i) The Secretary of War authorizes you as chief of this mission to issue such instructions to the members thereof as may be necessary for the proper performance of their duties.

Before the severance of the diplomatic relations between the United States and Germany, February 3, 1917, members of the mission were not given such opportunities as they later enjoyed,³⁸ for prior to that event the French were not certain where the sympathies of our Government lay, and naturally hesitated to permit American officers to make thorough inspections.³ During that period, nevertheless, members of the mission did enjoy certain facilities and submitted a number of reports on many subjects.³ After February 3, 1917, the mission's facilities for study of military methods and activities were greatly extended and it forwarded to the War College a great quantity of information, much of it highly technical in character.³ Revised instructions for the guidance of Medical Department military observers were sent to the chief of the mission and to the medical observers in England on February 10, 1917.³⁹

On February 14, 1917, the chief of the mission reported that at his request General Lyauty had given directions so greatly amplifying the privileges heretofore granted the American mission that it enjoyed practically "blanket" permission for obtaining any information it might seek.³⁸ It was arranged that the two medical members would visit the French Army school of asphyxiating gases and all medical depots, and would study on the ground the whole system of evacuation of wounded from the trenches to the base hospitals.³⁸ Accordingly, these medical officers took the full course of instruction at the French gas school and submitted a voluminous report covering confidential matters concerning the chemistry of gases employed, their manufacture, tactical employment, defenses against them, and the organization of the gas services of the French and German Armies. A study of the evacuation service was prosecuted, but as indicated below was not completed until after the United States entered the war. On February 9, one of the medical officers in question reported at length, among other subjects, on the organization of the French sanitary service and the operation of that service in campaign. He also compiled additional data concerning French and British defensive gas service which he later submitted to the chief of the Gas Service, A. E. F., when headquarters arrived in France.

A report submitted by the two medical members of the American military mission April 25 gave the results of a study of Medical Department organization required for any expeditionary force that might be sent to France. This document included statistics of wounded and a detailed description of

the radical reorganization of our service that would be required, and was accompanied by inclosures which discussed the general organization and administration of French medical service, with particular reference to their depots for the slightly sick and wounded and convalescent camps. Another report considered the utilization of volunteer American sanitary units in France.

Following the declaration of war, on April 6, 1917, the War Department called upon the mission through the military attaché for specific information on many subjects, and the facilities afforded members of the mission by the French, in order that they might furnish promptly and thoroughly any data required, were further extended by the detail to service with it of several officers of the French General Staff.³ They assisted in preparing surveys of ports, reports on condition and capacity of railways, location of training camps, depots, and other installations.

The mission reported to the War Department, on June 1, that for various reasons St. Nazaire and Nantes appeared to offer the best facilities for debarkation for the first American forces, and recommended on that date that such troops should be disembarked at St. Nazaire.⁴⁰ Accordingly, the French were requested to construct at this place a cantonment adequate to shelter a division of 20,000 men.³ It was also reported that because of the great congestion of this port it was advisable that our main central supply stations be located at Nevers where the French were prepared to transfer the station warehouses to the United States forces.³ It was recommended that training camps be located in the vicinity of Nancy and Toul. The following day two officers of the mission left for St. Nazaire to lay out the camp site and establish water supply services.³ The explicit applied problems of the Medical Department in France now began, for the water supply at St. Nazaire was not sufficient for the number of troops to be encamped here, and provision had to be made to overcome the deficiency.³ This was accomplished temporarily by placing water boats in service on the Loire to carry water from points some miles inland.³ One of the medical members of the mission had been charged with initiating necessary measures for rendering potable the water supply for our forces in France, and on May 19 had reported on the service of water in the French Army. As soon as the provision of a suitable water supply at St. Nazaire was settled the French harvested such of the crops on the prospective camp site as were sufficiently matured and began to erect the huts required and to install the camp water system.³ It was arranged that the sick would be cared for in a double-walled barrack hospital accommodating 300 beds, but after construction was well advanced word was received that the strength of a division had been increased to some 28,000 men, and it became evident that the buildings intended for hospital purposes would have to be utilized as barracks by the incoming troops.³ In this emergency the French were appealed to and at once turned over in St. Nazaire a military hospital with a capacity of 250 beds, the only military hospital in that community, and another of 500 beds at Savenay, a few miles inland.³ Arrangements were also made for the transfer of a hospital of 500 beds at Nantes and for the eventual transfer of several others, notably one of 1,100 beds at Bordeaux, but, as no personnel had yet arrived, definite arrangements concerning the latter institutions were held in abeyance until after the arrival of the commander in chief.³

Meanwhile, other activities also engaged members of the mission. A medical member of the mission, continuing investigations begun several months previously, visited the front, where he made an exhaustive study of the organization of the French Medical Department, its system of field hospitalization, classification of nonevacuable sick, evacuation of wounded by hospital train, medical supply, use of motorized sanitary organizations of various kinds (e. g. ambulance companies, surgical hospitals, radiologic, laundry, and other units) and related subjects. On May 31, he reported his observations, but the most valuable result of this study accrued from the fact that when our troops began their offensives, in May of the following year, he was able, because of his then assignment with G-4, G. H. Q., to give direct application to the results of these observations, and thus secure to the medical service at the front better cooperation than might have been possible from others not personally acquainted with the study made at this time.⁴¹ With a view of avoiding delay when our troops would begin to arrive, studies by the members of the American military mission, accompanied by officers of the French General Staff, were continued and new ones undertaken. These included further inspections of the railway systems and selection of locations for temporary supply depots.³ It was also decided, tentatively, that the first division that arrived should go into the training area around Gondrecourt. Here a small barrack hospital was taken over from the French who evacuated their patients.³ Construction to expand this unit to 300 beds was begun immediately and the French reequipped it with new material throughout, for it was realized that our own supplies would not at once be available.³

The members of the mission continued their activities in their assigned capacities until the arrival of General Pershing in Paris on June 13. In conformity with instructions received by the chief of the mission on June 5,⁴² that officer reported at the time in question to General Pershing with a view of informing him as fully as possible concerning existing conditions.³ At this time all members of the mission joined the staff of the commander in chief,⁴² and began the performance of new duties, continuing, however, a number of investigations which they had commenced prior to his arrival.

MEDICAL OFFICERS CHARGED WITH SPECIAL DUTIES IN FRANCE

On October 18, 1916, the Surgeon General requested that he be authorized to detail one of our medical officers for duty as superintendent, or officer in charge of a hospital at Passy, France, which was under the direction of the French Benevolent Society of New York, and requested that this officer be granted leave of absence for four months for that purpose.⁴³ The leave was granted,⁴⁴ and the officer in question was informed that he would go to France in a personal capacity, would have no connection with the United States Service and could not wear the uniform while in that country.⁴⁵ On May 7, 1917, the United States having declared war, he was formally assigned to duty at the hospital mentioned,⁴⁶ but on May 22, the Surgeon General notified the French Benevolent Society that this officer had been placed on a duty status, the United States having entered the war, and that all officers were needed.⁴⁷ He also requested information as to when he might be replaced. This officer

retained this assignment until October 3, 1917.⁴⁸ A few days later he was transferred to Blois and assigned as sanitary inspector of the line of communications, A. E. F.⁴⁹

Previous, but unsuccessful, efforts had been made by the Surgeon General to have another medical officer assigned to duty at the above-mentioned hospital at Passy, but at that time (June, 1916) this assignment was disapproved by the President on the ground of neutrality.⁵⁰ The officer, however, was selected later to serve as chief medical officer of a hospital at Ris Orangis, France. This officer was instructed to apply for leave and was assigned in the same status as the one referred to in the preceding paragraph, but while en route his orders were changed because of the entry of the United States into the war,⁵⁰ and he was definitely assigned to duty at this hospital May 7, 1917.⁵¹ Here he served as chief medical officer and conducted a large surgical clinic until assigned to duty at general headquarters, A. E. F., on March 7, 1918,⁵² meanwhile discharging a number of other duties pertaining to the standardization and procurement of splints, manufacture of nitrous oxide, and instruction of newly arrived medical officers in surgical technique.⁵⁰

On April 9, two additional medical officers^{53, 54} were granted leave for service in the hospital at Ris Orangis.⁵⁵ On May 7, they were definitely assigned thereto,⁵⁶ but on July 6, one was made one of the assistants to the chief surgeon, A. E. F.,⁵⁷ and on August 15, the other was detailed as commanding officer of United States Army Hospital No. 2.⁵⁸

BASE HOSPITAL PERSONNEL AND CASUAL MEDICAL OFFICERS, UNITED STATES ARMY, WHO SERVED WITH THE BRITISH EXPEDITIONARY FORCE BEFORE THE ARRIVAL OF HEADQUARTERS, A. E. F.

Prior to the entrance of the United States into the war a number of American citizens served individually in various capacities in the allied armies.⁵⁹ A number of others were members of organizations, composed largely, if not entirely, of Americans, which were under the military control of some European government.⁴¹ Several of these formations were later absorbed or taken over by the American Expeditionary Forces (e. g., the Ambulance Américaine, later American Red Cross Hospital No. 1, the ambulance field service, and American Red Cross Ambulance, later incorporated in the United States Army Ambulance Service), but until that time were not a part of our forces.⁶⁰

The elements of the American Army, other than the military attachés, military observers, and the military mission to France (discussed above), which first served in Europe after the declaration of war, were six base hospitals which had been organized by the American Red Cross, and inducted into service soon after the United States entered the war,⁶¹ and were now assigned to duty with the British Expeditionary Force in France.⁶² Also certain casual medical officers were assigned to duty with the British or French armies.⁶³

The circumstances which led up to the rendition of such prompt service and the composition and equipment of these units are discussed in Volume I, Chapter II, of this history.

When the British and French missions arrived in Washington in April, 1917, Col. Thomas H. Goodwin, of the Royal Army Medical Corps, requested

that six base hospitals and 116 casual medical officers be assigned to the British Expeditionary Forces.⁶⁴ The War Department called on the American Red Cross to furnish the hospital units for immediate transportation to France.⁶⁵ On May 1, 1917, the Surgeon General wrote The Adjutant General that it was the former's expectation that in the next three or four months, his department would send about 1,000 medical officers to Europe for service with the British Army and that they would begin to go over as rapidly as the Quartermaster Department could furnish transportation.⁶⁶ The hospitals selected sailed in the following order, between the 8th and 25th of May:

Base Hospital No. 4, organized at the Lakeside Hospital, Cleveland, Ohio.

Base Hospital No. 5, organized at Harvard University, Boston, Mass.

Base Hospital No. 2, organized at the Presbyterian Hospital, New York City.

Base Hospital No. 10, organized at the Pennsylvania Hospital, Philadelphia.

Base Hospital No. 21, organized at the Washington University, St. Louis, Mo.

Base Hospital No. 12, organized at the Northwestern University, Chicago.

To some of these units additional personnel was attached; e. g., a group of orthopedic surgeons was attached to Base Hospital No. 21.⁶⁷

After arrival in France the hospitals operated until after the signing of the armistice as general hospitals, British Expeditionary Force in France. They were located as follows:⁶⁸

No. 4, Rouen—operating British General Hospital No. 9.

No. 21, Rouen—operating British General Hospital No. 12.

No. 2, Etretat—operating British General Hospital No. 1.

No. 10, Treport—operating British General Hospital No. 16.

No. 12, Dannes Camiers—operating British General Hospital No. 18.

No. 5, Dannes Camiers—operating British General Hospital No. 11.

On November 1, 1917, Base Hospital No. 5 was transferred to Boulogne where it operated as British General Hospital No. 13.⁶⁹

On May 21, 1917, the American attaché at London recommended that our senior medico-military observer there be designated as chief surgeon for all American medical units and personnel serving with British medical service, such assignment being urgently indicated in order to coordinate and systematize the relations which must exist between the two services.⁶⁸

Some weeks prior to the arrival of General Pershing, the medical officer referred to in the preceding paragraph reported to the Surgeon General that he had assumed an unauthorized supervisory control over the American Medical Department personnel which had arrived in England before the commander in chief, for service with the British forces.⁶³ He stated that his position under these circumstances was such that he could neither act nor advise in any authoritative manner, and that his relation with British authorities had been purely advisory.⁶³ No instructions of any kind concerning this personnel had been received from Washington, though by June 11, 1917, 6 base hospitals and 52 casual medical officers had reported.⁶⁹

On May 26, 1917, by General Orders No. 1, headquarters, A. E. F., Washington, D. C., he was designated as chief surgeon of the United States forces in Europe,⁷⁰ to exercise over the forces under his control the same authority as the Surgeon General holds over the entire Medical Department.⁷⁰

Control of the Medical Department personnel serving with the British was taken up by the chief surgeon, A. E. F., with General Pershing after the latter's arrival, and this responsibility, on June 25, was vested in the liaison officer for the Medical Department with the British.²²

GENERAL ORGANIZATION AND DEVELOPMENT OF THE AMERICAN EXPEDITIONARY FORCES

The provision of a suitable organization for the American Expeditionary Forces by the creation of a staff which could give it intelligent direction was one of the first subjects that, from the outset, had engaged the attention of the commander in chief.⁷¹ He had formulated a tentative plan for this essential even before he embarked, and his headquarters had continued to study this subject while on shipboard and after arrival in Paris.⁷² Our Field Service Regulations provided certain guiding principles, but the experience and theory upon which they were based antedated the beginning of the war in Europe, and it was necessary that they be revised in the light of its developments.⁷² It was essential not only that the necessary staff services, as determined by developments of the war, be created, but also that the general scope of their individual and collective activities be defined, that the responsibilities of each staff service be fixed specifically, that overlapping or conflict of jurisdiction be eliminated, and that work be decentralized and individualized in designated offices.⁷²

In several important respects our position was different from that of any of the allied nations, and this fact had its influence in the application of the results of the comprehensive study, begun on the S. S. *Baltic* and now intensively continued, of British and French staff organizations.⁷¹ The French Army was fighting on its own soil, had immediate access to its War Department and to its civil government, and was close to the territory from which it procured most of its supplies.⁷¹ The British Army, though organized on an overseas basis, was also in close contact with its home Government and base.⁷¹ But the American Army was based on a continent 3,000 miles distant, with which communication was much more difficult; its organization, administration, and supply, therefore, offered peculiar problems.

It was foreseen that the uncertainties incident to ocean transport in the face of the growing submarine menace, the limited, though yet unknown, quantity of ship tonnage that would be available, and a line of land communications some 400 miles in length through a foreign country already strained by protracted war, would give rise to problems of organization, administration, and supply that would be almost insuperably difficult.⁷¹ At the outset the commander in chief had made the announcement that the expedition was to be under control of its general staff, which was charged with its orderly, symmetrical, and balanced development.⁷³ No one arm, bureau, or department was to be developed in advance of its needs or at the expense of others, but, as shown below, this ideal had to be modified because of military necessities.⁷³

Study of present and prospective problems in their intrinsic and extrinsic aspects led to the promulgation, on July 5, 1917, of General Orders, No. 8, G. H. Q., A. E. F., which provided for the creation of a general staff and technical administrative bureaus of the American Expeditionary Forces. This order, which was to form the basis of coordinated activities, directed that the general staff be divided into three major sections, intelligence, operations, and administration, each under an assistant chief of staff; apportioned various duties among them; provided for an administrative and technical staff, consisting of the chiefs of nine staff departments—adjutant general, inspector general, chief surgeon, and others—created the line of communications, and specified the duties of the American Red Cross. The organization of the American Expeditionary Forces was yet in a formative state, however, and a corrected copy of General Orders, No. 8, G. H. Q., A. E. F., published August 14, 1917 (but as of July 5), provided for a chief of staff, a secretary to the general staff, a general staff divided into 5 sections, an administrative and technical staff consisting of 15 departments, and a headquarter's command.

Both editions of this order provided that the distribution of staff duties at the headquarters of subordinate commands should conform in principle to the distribution of duties prescribed for headquarters. It is sufficient here to state that duties assigned to the several sections of the general staff at this time were as follows: First section, administration; second, intelligence; third, operations; fourth, training; fifth, coordination. The duties of the several sections, as they applied especially to the Medical Department are discussed more fully below.

The administrative and technical staff designated by this order consisted of the following: Adjutant general, inspector general, judge advocate, chief quartermaster, chief surgeon, chief engineer officer, chief ordnance officer, chief signal officer, chief of Air Service, general purchasing agent, chief of Gas Service, director general of transportation, commanding general line of communications, chief of Red Cross, provost marshal general.

The chiefs of the administrative and technical staffs were the local representatives of those bureaus of the War Department who were entitled to membership in the headquarters of our forces in the field or the chiefs of several newly created staff organizations, viz, the general purchasing board, the department of transportation, the line of communications, the American Red Cross.⁷² These services were given staff representation in order that new situations might be met. Like the heads of other bureaus composing the technical staff, their chiefs were equivalent in rank, and were coordinated with one another, and with the chiefs of previously existing staff departments whom they divested of some of their duties.⁷² Activities of all these administrative staff bureaus were directed and coordinated by the general staff, whose members as representatives of the commander in chief, communicated his plans with a view to their execution to the chiefs of the bureau concerned.⁷² By analogy to bureau chiefs in the War Department, their similars in the American Expeditionary Forces were charged with duties incident to administration, statistics, records, inspection, construction and operation in their respective jurisdictions, including the procurement of the necessary supplies and material

and forwarding these as required to the forces in the field.⁷² They were the advisers and executives of the commander in chief and his general staff in all matters, including those of a technical character incident to the operation of their respective departments.⁷²

In the early period of the American Expeditionary Forces the Medical Department was concerned chiefly with the first and fifth sections of the general staff.⁷⁴ The first, among its other duties pertaining to general matters of administration, was then charged with replacements, evacuation of sick and wounded, the ratio of combat troops to those serving on the line of communications, the respective ratios of staff and combat troops, supplies and transportation.⁷⁴ The fifth was charged at this time with coordination and application of administrative staff policies.⁷⁴ The importance to the Medical Department of the first section was incident especially to its control of allowances of ocean transport for personnel and supplies, and that of the fifth to its control of all hospitalization and depot projects—determining their need, size, location, installation, and other attributes.⁷⁴ Not infrequently several staff departments sought the same facilities and the fifth section coordinated these conflicting demands.⁷⁴

The duties of the several sections of the general staff and of the technical staff departments varied somewhat in accordance with successive reorganizations, especially those prescribed by Memorandum 129, published November 19, 1917; General Orders, No. 31, published February 16, 1918; General Orders, No. 114, published July 11, 1918; and General Orders, No. 130, published August 6, 1918.

Coincident with the organization of the general staff of the American Expeditionary Forces reorganization of the Army units was effected. As such units provided by our Tables of Organization when we entered the war were so small that they were quite inadequate for the service now required, an entirely new organization was prescribed.⁷¹ This provided that an Infantry combat division should consist of 28,172 officers and men, and should be composed of 2 infantry brigades, 1 field artillery brigade, 1 machine-gun battalion, 1 regiment of engineers, 1 field signal battalion, military police, train headquarters, and ammunition, supply, and sanitary trains.⁷⁵ The sanitary train originally consisted of train headquarters, 4 field hospitals, 4 ambulance companies, and 8 infirmaries,⁷⁶ but from time to time other organizations and equipment were added, e. g., a medical supply depot, a mobile laboratory, and as occasion required and resources permitted a mobile surgical unit and professional teams were attached to it.⁷⁷ Similarly there later developed great expansion in corps and armies and in organizations which served in the line of communications.⁷⁷ For example, the depot division at Aignan (the 41st Division) attained a strength of over 50,000 officers and men,⁷⁸ and the capacity of base hospitals was increased from 500 to 1,000 beds, or to 2,000 beds in emergencies—the so-called “crisis” expansion. In point of fact many of these hospitals exceeded 3,000 beds during the Meuse-Argonne operation.⁷⁹ New agencies in practically all services were developed and some reached a degree of importance which caused them to be made autonomous staff departments, their chiefs becoming members of the administrative staff of the Ameri-

can Expeditionary Forces, e. g., the Motor Transport Corps. Throughout its history there was a progressive development of the administrative services of the American Expeditionary Forces, the direction of this evolution being, with but one exception and that transient, toward decentralization.⁸⁰

The prospective disembarkation of several million men, their movement to training areas, provision for their shelter and the handling, storage, and distribution of the supplies and equipment required, called for an extraordinary and immediate effort in construction.⁸¹

To provide the organization for this purpose, a project for engineer services of the rear, including railways, docks, depots, hospitals, etc., was cabled to Washington, August 5, 1917, followed on September 18, 1917, by a complete project for the rear, which listed by item the troops considered necessary for the Services of Supply.⁸¹ Under this project the strength of the rearward services, from the firing line to base ports, would constitute about 35.5 per cent of the entire expeditionary force, for it included divisional, corps, and army trains and similar noncombatant organizations at the front, as well as the personnel operating ports, depots, transportation, and other facilities.⁸² Despite our longer line of communications this percentage was less than that of the British whose rearward services absorbed 37.5 per cent of their total expeditionary strength, while steps were being taken to increase this to 40 per cent.⁸² To the strength called for by the organization project (1,000,000 men), this project added 329,653 men, bringing the total for a balanced force, conforming to the organization project, to 1,328,448 men.⁸² The line of communications projects called for approximately 25 per cent of this total, but because of military exigencies that command never received the full quota of troops required for its installations and activities.⁸²

Beginning on July 6, 1917, a series of cables was sent to the War Department fixing the order in which troops should arrive, but it was evident that these cables were of but transient value and that the War Department should be furnished a comprehensive statement of the personnel and supplies needed, in order that there might be built up a balanced and symmetrical force, appropriately supplied and equipped.⁸¹ Therefore, a schedule of priority shipment of personnel was prepared covering the order in which the troops should be sent to Europe.⁸¹ This schedule, approved by General Pershing and forwarded to the War Department on October 7, divided the initial force called for into six phases, corresponding in general to combatant corps of six divisions each.⁸³

The French minister of war assigned to duty with headquarters of the American Expeditionary Forces, than at Chaumont, a special liaison officer who was the channel of communication between his office and the commander in chief, A. E. F.⁸⁴ The French high command also established at Chaumont a French military mission which was organized with the same divisions or bureaus as the French General Staff.⁸⁴ One of its sections was charged with Medical Department matters. This mission had full authority to act for the French Ministry of War and the French commander in chief in all matters concerning the relations of the various American services and those of the French armies, both in the French zone of the armies and the zone of the interior.⁸⁴ The chiefs of the administrative and technical services of the Ameri-

can Expeditionary Forces were authorized to communicate directly with this French mission in all matters that concerned the operation of their particular services, except such as involved questions of policy. Communications on subjects in that category were prepared for the signature of the chief of staff and submitted to him.⁸⁴ All questions of whatever nature affecting the medical services in the zone of the army were handled through the office of the medical member of this mission.⁸⁵

The commanding general, Services of Supply, A. E. F., the general purchasing agent and the director general of transportation were authorized to communicate directly with the various services in the French zone of the interior in all matters coming under their own particular control providing such correspondence did not involve questions of policy.⁸⁴ If it did, they prepared, initialed, and submitted letters for the signature of the chief of staff, A. E. F., but when the question at issue required the action of any French service in the French zone of the armies, the letter was prepared for the signature of the commander in chief.⁸⁴

Both before and after the provision of our liaison service, conferences concerning problems of importance, were held from time to time between high officers of our service and those of our allies. Among these were the conferences held by General Pershing with the commander in chief of other forces and those conducted by members of the general staff or the chiefs of administrative staff departments.⁸⁶

The American forces were also represented on a number of interallied councils which were chiefly concerned with procurement. The Allied Maritime Transport Council was engaged primarily in provision of tonnage in relation to the four main requirements, viz, food, munitions, raw materials, and fuel supply of the American Expeditionary Forces during 1918-19.⁸⁷

The resources of our allies in men and material had been taxed to very grave limits, but they always stood ready to furnish us with needed supplies, equipment, and transportation when these were at all available. The development of our program for construction, transportation, hospitalization, and other essential activities predicated the highest degree of cooperation between the American and allied services.⁸⁸

With the growth of the American Expeditionary Forces the activities of the several sections of the general staff not only became greatly intensified but also widely extended in scope.⁸¹ The first section engaged in development of policies, and the fifth (which, as is explained below, later became the fourth charged with supply and coordination) continued to be of special interest to the Medical Department.⁸¹ The fifth section necessarily supervised more and more closely the activities of the various supply bureaus with a view of balancing effort and keeping all establishments on a corresponding footing.⁸¹ As problems increased in number and complexity it developed that the division of duties and responsibilities between the coordination and administration sections were not fully understood outside of the sections themselves.⁸⁹ These were redistributed to a degree, by Memorandum No. 129, H. A. E. F., November 19, 1917, in which the duties of each of these sections were carefully defined.⁸⁹ The same order which decentralized and simplified staff methods of adminis-

tration, also indicated the direction in which the fifth, or coordination section, was developing by specifying its duties as follows:⁹⁰

All questions concerning supply and transportation in France. Operations of the technical services except the Red Cross, Y. M. C. A., and other similar agencies, the General Pershing Board, War Risk Bureau, auditors, and Field Ambulance Service. Operations of the line of communications and the transportation department. Statistics concerning supply, construction, and transportation. Supply and transportation arrangement for combat. Assignments of labor and labor troops. Location of railway and supply establishments. Hospitalization and evacuation of sick and wounded. Orders for assignment of new units.

In the meantime, studies of the British and French systems of staff organization as well as our own were continued with the result that a system giving more thorough staff coordination and control of the important services of construction, transportation, and supply was evolved.⁹⁰ Among other changes, the evolved system restricted the jurisdiction of the coordination section in the supply of the American Expeditionary Forces to matters intrinsic to that command and delegated to the first (administrative) section the supervision of procurement from the United States, the allotment of tonnage, and the arrangements for transportation to France, while the coordination section continued to deal with questions of supply and transportation in France.⁹⁰ Matters arising under these two latter subjects included operations of the technical and supply services, operations on the line of communications, and activities of the transportation department. Studies and recommendations for the location and character of railway and other establishments required for the transportation and service of our troops continued to come to this section for approval.⁹⁰ The same was true with regard to all depot and hospitalization projects, including not only the location of these installations, but also the storage capacity of depots and the bed capacity of hospitals. Arrangements for the evacuation of sick and wounded and orders for the original assignment of troops arriving in France were also made in this section. In the course of time, however, as the armies began to take shape, the procedure involved in such assignment became practically automatic.⁹⁰

By the middle of January, 1918, it became evident that some important, if not radical, reorganization of general headquarters was necessary.⁹¹ Accordingly, on January 22, 1918, the following letter was sent by direction of the commander in chief to the heads of all staff departments:⁹²

1. General Orders No. 8, G. H. Q., A. E. F., 1917 (corrected), prescribing the distribution of staff duties at these headquarters has been in operation long enough to give the system a fair trial. While it is believed that the fundamental principles of the order are generally sound, cases have arisen where there is an overlapping of functions. In some cases experience may have shown that certain subjects have been incorrectly assigned or not distinctly defined.

2. The principles of the order seem to be well understood by those primarily concerned with its operation, but, on the other hand, it does not seem to be so drafted as to give a clear presentation of the system to the outsider.

3. With a view of taking advantage of the experience thus far gained in the operation of this order, it is desired that you submit, not later than February 5, a report with your recommendations embodying the following:

- (a) What changes, if any, do you recommend for your own section or department?

(b) What changes, if any, do you recommend in any section or department, other than your own, which would facilitate the work of your section or department?

(c) Any suggestions which would make the order more clear to an outsider who has to deal with the system.

(d) Any other suggestions or recommendations on the subject of organization of these headquarters and the line of communications.

To the questions raised in the foregoing, the chief surgeon, A. E. F., under date of February 4, 1918, replied as follows: ⁹³

1. It is believed that the assignment of duties in this order so far as it concerns the Medical Department are substantially correct, and so far as can be ascertained there is no overlapping of functions. Some of the duties which were not exactly clear when the orders were issued have been settled completely, and it is believed that the assignments are satisfactory to the Medical Department at present. Since the order was issued much of the technical work of the Medical Department has been assigned to the coordinating section of the general staff instead of the administrative section. This is perfectly satisfactory to the Medical Department. Frankly, it is believed to be a step in advance.

2. The chief surgeon is pleased to present certain recommendations in regard to the work of his office:

(A) 1. Since headquarters have come to Chaumont, we have been handicapped in the hospitalization section of this office by reason of the fact that our hospital construction is done by the chief engineer, line of communications, and the running repairs and certain materials for these hospitals are furnished by the chief quartermaster, line of communications, and by further fact that we must correspond with those officers through their chiefs at these headquarters. There has also been a delay in the transaction of business by reason of the fact that investigation from this office of contemplated hospital sites and of construction, the making of leases, etc., is difficult by reason of the great distance to many of our hospitalization sites. For this reason it is believed to be good administration to remove a part of the hospitalization section from this office to the line of communications, and to request authority to transact business with the chief engineer, line of communications, and the chief quartermaster, line of communications, through this branch of the hospitalization service. This, it is believed, will facilitate business and lessen to a great extent the necessary official correspondence. This part of the hospitalization section can make a great many of the inspections of contemplated hospital sites, inspections of construction, leases, etc., without taking an officer from this office—a saving of time and mileage.

2. It is believed that the statistical section of the sanitary and statistical division (the sick and wounded) of this office can be detached from this office without loss of efficiency. In my opinion this section should be in Paris where it will be in close touch with the French bureau of statistics where necessary data for American patients in French hospitals must be obtained. If for any good and sufficient reason this location can not be approved it should be separated from general headquarters and attached to chief surgeon's office, headquarters, line of communications.

3. The time has come when the question of general sanitary inspectors for the American Expeditionary Forces must be taken up. This subject has not been presented before, because suitable officers were not available for this very important work. As officers with the required qualifications will soon arrive in France this question will be presented in a very short time.

(B) 1. The coordinating section of the general staff is modeled after the fourth bureau of the French War Department, but in accepting this organization, a very important part of the fourth bureau, as far as the Medical Department is concerned, was omitted, namely, Medical Department representation. The fourth bureau of the French War Department works in a most satisfactory manner to its medical department for several medical officers are constantly on duty at general headquarters with that bureau. I strongly urge that the Medical Department be given representation on the general staff. It seems so clear that this should be done that it is believed specific failures of coordination under the present organization need not be presented. Moreover the time is rapidly approaching when the demand for this representation will become more urgent.

2. It is believed a part of the hospitalization section should be sent to the line of communication and that this office should be authorized to transact business direct through this section with the chief engineer, line of communications, and chief quartermaster, line of communications, in regard to all questions of approved hospitalization.

3. It is believed that the activities of the American Red Cross so far as they relate to the Medical Department should be transacted through the coordinating section instead of the administrative section of the general staff.

(C) 1. No suggestions to make under this heading.

(D) The following recommendations are made:

1. It is strongly urged that the Medical Department be given representation on the general staff.

2. That an officer of the Medical Department be appointed liaison officer with the French service de santé. Practically all the hospitals that we possess to-day in France have been transferred to us by this service and we have been greatly handicapped by not having a liaison officer in the office of the sous-secretaire du service de santé. They consider this of such great importance that they have repeatedly asked for this representation from the Medical Department.

3. That the supervision of the activities of the American Red Cross so far as they relate to the Medical Department be transferred from the administrative section to the coordinating section, general staff.

4. That authority be given for the transfer of a unit of the hospitalization office to the line of communications and that this office be authorized to conduct its correspondence with the chief engineer, line of communications, and chief quartermaster, line of communications, on all approved projects through this unit.

5. That the statistical section of the sanitary and statistical division of this office be transferred elsewhere.

6. That a statistical unit be stationed in Paris in close liaison with the statistical division of the French War Department for the collection and transmission to Washington of the sick and wounded data required by the Pension Bureau. This is believed to be necessary by reason of the great number of sick we will have in French hospitals for many months to come and by the further fact that we will also have in our hospitals many French patients.

A board appointed to meet and consider the replies of the various staff chiefs met on February 8 and heard the chiefs of staff departments and other interested officers. It reduced all views and suggestions to the following questions:⁹⁴

(1) What changes, if any, should be made in the administration of supply in order to relieve the commander in chief from the immediate direction thereof, and place direct and complete responsibility therefor upon some competent authority?

(2) What changes, if any, should be made in the organization of the General Staff, in order to insure greater efficiency and more harmonious relations?

(3) What further changes, if any, should be made as a result of the disposition of the foregoing questions?

An analysis of the situation as developed by these inquiries was made with a view of effecting necessary improvements. It was found that diversity of opinion and practice existed among the different chiefs of the administrative services with respect to the degree of personal responsibility assumed and methods employed in details of supply; also, in decentralizing to secure a distribution of the heavy burdens of administration and the execution of the tasks incident thereto, there had been an undesirable division of responsibility and authority which at times led to uncertainty and hesitancy which might prove disastrous in an emergency.⁹¹ The analysis also indicated the immediate necessity for providing a single and direct line of responsibility for all matters

of supply with coincident full utilization of the services of the experienced chiefs of the various administrative and supply departments. The board made a number of important findings and recommendations, which were approved by the commander in chief and given practical application by the publication of General Orders, No. 31, G. H. Q., A. E. F., February 16, 1918.⁹¹ Other important recommendations having been submitted later, a corrected copy of this order was published March 13, 1918, but as of the date of the original.⁹¹ Some of its most important provisions may be mentioned here; e. g., control of combatant troops was separated from that of all supply departments and of miscellaneous organizations in rear of them, the whole American Expeditionary Forces being divided into the zone of the armies and the Services of Supply (designated in the first copy of this order as the Service of the Rear). Over the former, comprising the organizations at the front (armies, corps, divisions, etc.) the general staff exercised direct control while over the latter its control was indirect, through the commanding general, Services of Supply. The general staff remained at headquarters, A. E. F., at Chaumont, but headquarters of the Services of Supply was located at Tours where it absorbed headquarters of the preexisting line of communications.

The general staff was reconstructed as follows: A chief of staff, secretary of the general staff, and five sections of the general staff, each under an assistant chief of staff, were provided for, and among these specific duties were allocated. The numerical designation of each section now corresponded closely to that of the section of the French General Staff which was charged with similar duties. Though this correspondence was incidental to the reorganization, it facilitated the transaction of business between the two armies.

The administration section became the first section, the intelligence section became the second, and the operations, coordination, and training sections became, respectively, the third, fourth, and fifth sections of the general staff. For convenience the names of the sections were abbreviated to G-1, G-2, and so forth.

As to the duties assigned to these several sections it is sufficient here to state that G-1 was charged, among other duties, with ocean tonnage, priority of overseas shipments, replacements, organization, and equipment (in consultation with G-3) and with control of the American Red Cross, Young Men's Christian Association, and similar agencies; G-2 was charged with procurement of information, secret service, topography, and censorship; G-3 with operations, liaison, general organization, and equipment; G-4 with supply, construction, and transportation in France, statistics concerning the above, supply and transportation for combat, hospitalization, and evacuation of the sick and wounded, all operations of the Services of Supply not assigned to other sections of the general staff and assignment of all new units arriving in France; G-5 was charged with all activities pertaining to training, and it cooperated with the third section in matters affecting organization and equipment.

As the first, fourth, and fifth sections of the general staff were now of especial interest to the Medical Department, some further discussion concerning them is deemed necessary.

It was not intended that the administrative section of the general staff should directly control any of the supply bureaus, nor supplant the executive

heads of these important services, nor limit them in the exercise of their authority in the internal administration of their own departments.⁹⁴ The sole function of this section of the general staff was to supervise the general policies of the American Expeditionary Forces, in so far as this section was concerned, to coordinate the activities of those departments and troops which were engaged in the services of administration, supply, and evacuation, to preserve a just balance between them, and to insure that their operations as a whole harmonized with one another and with the plans of campaign.⁴³

The fourth section of the general staff was the connecting link between the general staff on the one hand and the Services of Supply on the other in all matters affecting the Services of Supply which were not assigned to other sections of the general staff. Its functions in maintaining intimate relations between the office of the chief of staff, G. H. Q., and these various agencies in the Services of Supply were both executive and advisory.⁹⁰ It kept available the latest information regarding supplies, state of construction, and efficiency of rail transportation, studying and frequently reporting upon the practical working of all technical staff and supply departments. Projects of any importance, especially those involving location of facilities, were examined by this section to assure their harmony with the general scheme.⁹⁰ This section, which had become of especial interest to the Medical Department after the publication of Memorandum No. 129, H. A. E. F., 1917, which charged it, among other duties, with, the provision of hospital facilities and the evacuation of sick and wounded, continued to exercise jurisdiction over a larger number of the interests of the Medical Department than did any other section of the general staff.⁹⁰ Its greatest importance to the Medical Department arose from its control of policies and programs for hospitalization, storage, transportation and supply, evacuation of wounded, assignment of units newly arriving in France, and staff control of labor.⁹⁰

Also, the fact that it was charged with supervision of all operations of the Services of Supply, not assigned to other sections of the general staff, brought under its control a number of other matters, in which the Medical Department was interested.⁹⁰ Because of the importance to the Medical Department of the American National Red Cross, particularly in matters pertaining to hospitalization and supply, an effort was made to have control of this society transferred to this section, but this was unsuccessful.⁹⁰

The fifth section, general staff, was charged with instruction and training throughout the American Expeditionary Forces.⁹⁵ These included technical training, preparation of manuals on that subject, promulgation of training bulletins and courses of instruction, supervision of centers of instruction, and staff schools. After the armistice was signed it was vested with control of education, athletics, and entertainment.⁹⁵ This section was of especial interest to the Medical Department through the supervision it exercised over the Army sanitary school at Langres, the Joinville training area, where medical units awaiting assignment were concentrated, and over the training of medical units and detachments in divisional training areas.⁹⁵

After the reorganization prescribed by General Orders, No. 31, the general staff continued to concern itself with the broader phases of control. Under the



FIG. 1.—Lines of communication, A. E. F., showing also the sections comprising the Services of Supply

LINE OF COMMUNICATION, A. E. F.
OFFICE OF ENGINEER OF CONSTRUCTION, T. S.
NOVEMBER 1918

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supervision of the commander in chief and pursuant to clearly determined policies, the assistant chiefs of staff at the head of their respective sections, severally coordinated by the chief of staff, issued instructions and gave general direction to the great combat units and to the Services of Supply, keeping always in close touch with the manner and promptness of compliance.⁹⁶ Thus a system of direct responsibility was put into operation which contemplated secrecy in preparation, prompt decision in emergency, and coordinate action in execution.⁹⁶ This supervision by the general staff included matters relating to new troops and new equipment, excepting only such details as pertained to the troops in the Services of Supply.⁹¹ General headquarters, A. E. F., also retained immediate control of military transportation and supply in the zone of the armies and control of war material required in the conduct of military operations.⁹¹

The plans for operations of the Allies were communicated only to the commander in chief and by him to a small number of higher staff officers under his immediate command.⁹¹ Arrangements for the employment of American troops in conformity therewith were necessarily made at general headquarters, and G-4 being responsible for supply and transportation arrangements for combat, was obliged to keep in close touch with the Services of Supply in order that the activities of that command might be fully coordinated with the prosecution of the plans of the commander in chief.⁹¹

The chiefs of the three purely administrative staff services were retained with the general staff at general headquarters, which remained at Chaumont, but the chiefs of the other staff departments were transferred to headquarters of the Services of Supply at Tours.⁹⁵ The departments whose chiefs were retained at general headquarters were those of the adjutant general, the inspector general, and the judge advocate.

As previously stated, the jurisdiction known as the line of communications was replaced by the Services of Supply.⁹⁵ The commanding officer of this jurisdiction, whose headquarters remained at Tours and whose official status remained unchanged, was charged with transportation, construction, territorial command, and control of supply, sanitary, and telegraph service throughout the territorial area of the Services of Supply. The Services of Supply was divided for administrative purposes into an advance section, an intermediate section, eight base sections in France, England, and Italy, the district of Paris, and the Arrondissement of Tours.⁹⁵ After the armistice was signed a ninth base section was established with headquarters at Antwerp for the service of the Third Army.⁹⁷

While the chiefs of the purely administrative services (the adjutant general, the inspector general and the judge advocate general) were retained with the general staff at headquarters, A. E. F., at Chaumont, the chiefs of what were now designated the "technical and administrative" staff departments, were transferred to the headquarters of the Services of Supply at Tours.⁹⁵ The department whose chiefs were thus transferred were the following: The Quartermaster Corps, Medical Corps, Corps of Engineers, Ordnance Department, Signal Corps, Air Service, general purchasing board, Gas Service, service of utilities (newly created by this order) and the provost marshal service. The

chiefs of these staff departments retained their former duties and authority as members of the staff of the commander in chief but exercised their duties in matters of procurement, transportation, and construction and supply under the direction of the commanding officer, Services of Supply, who coordinated their activities in these matters. They were directed so to organize their offices that the efficiency of their service would not be impaired by necessary absences for conferences with the commander in chief or for other duty assigned them by him.

Each was authorized and expected to travel throughout the American Expeditionary Forces to supervise and direct the activities of his department in all its elements, including combat units. The duties of these chiefs of staff departments were therefore of a dual character. Thus the chief surgeon, A. E. F., was, on the one hand, the chief surgeon of the Services of Supply, supervising Medical Department activities throughout its area, and, on the other, was the chief surgeon of all the American troops in Europe from the Murman coast to Italy.

In so far as the Services of Supply is concerned, it is sufficient to state here that the staff organization of that jurisdiction consisted of a general staff, divided into four sections (later reduced to three), and of an administrative staff whose departments rapidly increased in number.⁹⁸

Besides effecting the changes already mentioned, General Orders, No. 31, G. H. Q., A. E. F., February 16, 1918, further directed that the distribution of staff duties in army, corps, divisions, and other commands subordinate to general headquarters, correspond in principle to that prescribed for general headquarters. General Orders, No. 9, G. H. Q., A. E. F., January 15, 1918, which had created the First Army had provided for that organization a chief of staff, a general staff of 4 sections and 12 administrative and technical services, but by General Orders, No. 120, G. H. Q., A. E. F., July 24, 1918, its staff was made to consist of a chief of staff, 5 general staff sections, a chief of artillery, and 13 administrative and technical services. The same organization was prescribed for the Second Army, created by General Orders, No. 175, G. H. Q., A. E. F., October 10, 1918, and for the Third Army, created by General Orders, No. 198, G. H. Q., A. E. F., November 7, 1918, except that for the last mentioned no tank service was provided.

The headquarters staff of the First Corps as organized by General Orders, No. 9, G. H. Q., A. E. F., January 15, 1918, consisted of a chief of staff, a general staff of 4 sections (administrative, intelligence, operations, and training, and coordination), and 12 administrative and technical services. The same organization was prescribed for the Second, Third, and Fourth Corps by General Orders, No. 102, G. H. Q., A. E. F., June 25, 1918, but by General Orders, No. 136, August 19, 1918, the organization of a corps was made to conform to Tables of Organization 102, series B, War Department, corrected to April 20, 1918. Thereafter the headquarters staff of each corps consisted of a chief of staff, 3 general staff sections (1, operations; 2, administration and coordination; and 3, intelligence), and 12 administrative and technical services until a thirteenth staff service (the motor transport) was added, by General Orders, No. 219, G. H. Q., A. E. F., November 29, 1918. Similarly, the headquarters

of an Infantry division as prescribed by Table 2, series A, Tables of Organization, dated October 1, 1918, provided for a general staff with the same sections as those authorized for the corps and for nine administrative and technical staff departments.

The system of general staff control and subdivision prescribed for headquarters of the American Expeditionary Forces thus was applied to lower echelons of the field forces, except that in corps and divisions, the fourth section was merged with the first and the fifth section with the third.⁹⁶ Control of the field activities of the Medical Department which were vested in the fourth section of the general staff at headquarters, A. E. F., was thus assigned to the control of G-1 in corps and divisions—a circumstance which proved to be undesirable and confusing.⁹⁹

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- (68) Cablegram from the military attaché at London, to the Surgeon General, May 21, 1917. On file, A. G. O., World War Division, chief surgeon's files, 201 (Bradley, A. E.).
- (69) Letter from the chief surgeon, A. E. F., to Maj. W. J. L. Lyster, M. C., American Embassy, London, June 11, 1917. Subject: Administration of American medical personnel serving with British Forces. On file, Record Room, S. G. O. 9795 (Old Files).
- (70) Letter from The Adjutant General to Col. A. E. Bradley, M. C., May 28, 1918. Subject: Designation as chief surgeon, U. S. Forces in Europe. On file, A. G. O., World War Division, chief surgeon's files, 201 (Bradley, A. E.).
- (71) Final report of Gen. John J. Pershing, September 1, 1919, 11.
- (72) Report from the assistant chief of staff, fourth section, general staff, General Headquarters, A. E. F., to the chief of staff, A. E. F., June 1, 1919, 12. On file, General Headquarters, A. E. F. Records.
- (73) Report from the assistant chief of staff, Fourth Section, G. H. Q., A. E. F., 11.
- (74) General Orders, No. 8, General Headquarters, A. E. F., July 5, 1917 (corrected copy).
- (75) Tables of Organization No. 1, Series "A," W. D., August 27, 1918.
- (76) Tables of Organization No. 28, Series "A," W. D., April 17, 1918.
- (77) Report from the chief surgeon, A. E. F., to the Surgeon General, U. S. Army, May 1, 1919. Subject: Activities of the chief surgeon's office, to May 1, 1919. On file Historical Division, S. G. O.
- (78) Medical History of the 41st Division (undated). On file, Historical Division, S. G. O.
- (79) Report from Col. S. H. Wadhams, M. C., chief of medical group, fourth section, general staff, General Headquarters, A. E. F., to chief of fourth section, general staff, Headquarters, A. E. F., December 31, 1918, 17. Copy on file, Historical Division, S. G. O.
- (80) Organization of the Services of Supply, A. E. F., Monograph No. 7, prepared by Historical Branch, War Plans Division, General Staff, June, 1921, Washington, Government Printing Office. War Department, Document No. 1009, 17.
- (81) Final report of Gen. John J. Pershing, September 1, 1919, 8.
- (82) Memorandum from Gen. John J. Pershing, to The Adjutant General, U. S. Army, September 18, 1917. Subject: Service of the Rear and Line of Communications. On file, General Headquarters, A. E. F. Records.
- (83) Memorandum from the commander in chief to The Adjutant General, U. S. Army, October 7, 1917. Subject: Priority of shipment (personnel). On file, General Headquarters, A. E. F. Records.
- (84) General Orders, No. 40, G. H. Q., A. E. F., September 20, 1917.
- (85) Organization of the Services of Supply, A. E. F., Monograph No. 7, 19.
- (86) Statement based on the final report of General Pershing, September 1, 1919, and report of the assistant chief of staff, fourth section, general staff, General Headquarters, A. E. F., to the chief of staff, June 1, 1919. On file, General Headquarters, A. E. F. Records.
- (87) Minutes of the Allied Maritime Transport Council, September 27, 1918. On file, Historical Branch, War Plans Division, General Staff.
- (88) Final report of Gen. John J. Pershing, 90.

- (89) Report from the assistant chief of staff, fourth section, G. H. Q., A. E. F., appendix "J."
- (90) *Ibid.*, 15.
- (91) *Ibid.*, 16.
- (92) Letter from commander in chief, to chiefs of staff departments, A. E. F., January 22, 1918. Subject: Reorganization. On file, A. G. O., World War Division, chief surgeon's file, A. E. F. (321.6).
- (93) Letter from the chief surgeon, A. E. F., to the commander in chief, A. E. F., February 4, 1918. Subject: Reorganization. On file, A. G. O., World War Division, chief surgeon's file, A. E. F. (321.6).
- (94) Report from the chief surgeon, A. E. F., to the commanding general, S. O. S., A. E. F., July 1, 1918. Subject: The medical department in the A. E. F., to May 31, 1918. Copy on file, Historical Division, S. G. O.
- (95) General Orders No. 31, General Headquarters, A. E. F., February 16, 1918.
- (96) Final report of Gen. John J. Pershing, September 1, 1919, 12.
- (97) *Ibid.*, 68.
- (98) Organization of the Services of Supply, A. E. F., Monograph No. 7, 25.
- (99) Reports from the assistant chief of staff, fourth section, General Headquarters, A. E. F., 22.

SECTION I

ORGANIZATION AND ADMINISTRATION OF THE CHIEF SURGEON'S OFFICE

CHAPTER I

GENERAL ORGANIZATION AND DEVELOPMENT

On May 10, 1917, the Surgeon General wrote The Adjutant General of the Army as follows:¹

I recommend:

That Col. Alfred E. Bradley, Medical Corps, in addition to his present duties as observer with the English Army, be designated as chief surgeon United States forces in Europe.

That, as chief surgeon of United States forces in Europe, Colonel Bradley be authorized to exercise over the forces under his control the same authority as the Surgeon General holds over the entire Medical Department. Similar authority was granted, on the approval of the Secretary of War February 18, 1899, to the chief surgeon of the Department of the Pacific and Eighth Army Corps (now the Philippine Department).

In conformity with the foregoing request, The Adjutant General wrote to the officer in question, on May 28, as follows:²

The Secretary of War designates you, in addition to your present duties as chief surgeon, United States forces in Europe.

The Secretary authorizes you, as chief surgeon of the United States forces, to exercise over the forces under your control the same authority as the Surgeon General holds over the entire Medical Department.

Meanwhile, on May 26, 1917, this officer had been designated chief surgeon of the American Expeditionary Forces in General Orders, No. 1, of that organization, which was published in Washington, D. C., but neither the foregoing letter nor a copy of the order mentioned was received by him prior to the arrival of headquarters, A. E. F., in London, on June 9, 1917.³

The Medical Department personnel which accompanied the commander in chief consisted of 4 officers, 2 enlisted men, and 4 civilian clerks.⁴ On arrival in London they were joined by the chief surgeon, who had been serving as military observer with the British, but who, on May 29, had been relieved from that assignment.⁵ One of his first duties as chief surgeon, A. E. F., was the formulation of instructions for the liaison officer for the Medical Department with the British, who also had been serving as a military observer and who was now charged with supervision of the base hospitals and casual personnel of the American Expeditionary Forces which were under British control.⁶

On June 13, headquarters, A. E. F., moved to Paris,⁷ where, by the 17th, it was joined by three other medical officers who had been serving as military observers with the French or British forces.⁸ When headquarters, A. E. F., established itself in Paris the chief surgeon's office force, now consisting of



BRIG. GEN. ALFRED E. BRADLEY, M. C., CHIEF SURGEON, A. E. F., TO APRIL 30, 1918.



BRIG. GEN. WALTER D. McCAW, M. C., CHIEF SURGEON, A. E. F., OCTOBER 10, 1918, TO JULY 15, 1919.

seven medical officers and about twice that number of clerks, was located, with other bureaus, in a small residential building where it occupied three small rooms.⁹ Almost immediately the chief surgeon and certain members of his staff began tours of inspection in order to determine matters concerning hospitalization at base ports and along the line of communications.¹⁰ On July 4, a medical officer was relieved from duty in the chief surgeon's office and assigned as surgeon of base section No. 1 (St. Nazaire), where the first contingent of troops was expected to debark.¹¹

When the staff of the American Expeditionary Forces was organized and its several duties were defined by General Orders, No. 8, Headquarters, A. E. F., July 8, 1917, the functions assigned to the Medical Department were as follows:

Sanitation of camps, quarters, and occupied territory; health of command; care of sick and wounded; collection and evacuation of sick and wounded; medical personnel; medical supplies; veterinary personnel; veterinary supplies; laundries and baths (medical aspect); disinfection of clothing, etc.; supply of personnel and material for gas defensive under supervision of director of gas service; technical inspection of medical organizations and establishments, etc., etc.

Until the administrative structure of the American Expeditionary Forces was radically changed, as noted in the preceding chapter, by General Orders, No. 31, General Headquarters, A. E. F., February 18, 1918, the staff organization in general was comparable to that existing in the War Department. The relationship of the chief surgeon's office to the general staff and to the chiefs of administrative staffs was similar to that existing between the Surgeon General's office, on the one hand, and the General Staff and the several bureaus of the War Department, on the other.^a

Until the American Expeditionary Forces was reorganized by the order mentioned the chief surgeon was located at headquarters with the general staff and the chiefs of other administrative staff departments, and he or his assistants, therefore, were enabled to transact business directly with the staff offices concerned.¹²

As the general staff was charged with approval and coordination of all policies and projects for the American Expeditionary Forces the chief surgeon or his assistants took up directly with appropriate sections of that body all matters pertaining to the medical service which required its authorization, coordination, or execution.¹²

The more important policies usually were placed on record and then discussed verbally.¹² It was quickly realized that very close cooperation of all elements was necessary at general headquarters and that only through centralized control could prompt results be secured conforming to changing conditions.⁹ Careful studies were made of future needs and these after being approved by the general staff, were cabled to the United States.⁹

Communication between the chief surgeon's office and that of the Surgeon General was carried on by letter direct, or, if circumstances required, through official channels, or by cable.¹³ Communications cabled from one office to the other passed through the respective cable offices in headquarters, A. E. F., and in

^a Such relationship is described in Volume I of this history.—*Ed.*

the War Department.¹³ Copies of cables which the chief surgeon's office wished to send were submitted to the adjutant general, A. E. F., if they pertained to administrative matters, or if to other matters, to the Chief of Staff who referred them for examination to the appropriate section of the General Staff.¹⁴ A section in the office of the adjutant general edited all cables for clearness, arranged them for logical sequence with previous telegrams, and incorporated them with drafts of other cables on the same subject from other departments into one long message signed, "Pershing."¹⁵ The avenues for transaction of business with the medical service of the Allies are discussed in Chapter III.

After the arrival of headquarters of the 1st Division on June 26, 1917, and that of considerable casual personnel, the work of the chief surgeon's office had so multiplied that the office space in headquarters, A. E. F., had become over-taxed.⁹ Therefore, about the middle of July that office, with some other special branches of the headquarters group, moved to more commodious in the Hotel St. Anne, in the street of that name.⁹

Here some of the more important policies of the Medical Department were developed and adopted and considerable creative and constructive work was accomplished.⁹ Problems which arose during the earlier stages of the American Expeditionary Forces when headquarters was located at Paris, and later at Chaumont, included determination of general policies, such as location and size of hospitals, percentage of hospital beds to total strength of the American Expeditionary Forces; estimates of quota, distribution and training of personnel; amount and character of Medical Department supplies required; relative priority of Medical Department personnel and supplies in shipments from the United States; the tonnage such supplies would require; character and quantities of supplies that could be procured advantageously overseas; size and location of storage depots; provision of hospital trains; arrangements for care of casualties at the front, for their removal from the lines, distribution and treatment in the rear, and, if need be, sending them home; organization of gas defense; standardization of splints; provision of agencies for transaction with the Allies of business which was of mutual interest, e. g., procurement of sites for hospitals and other installations; procurement of facilities from or through the American Red Cross; control of infectious diseases, especially of venereal diseases; organization of the laboratory system and of the professional services; and many cognate subjects.¹⁵ These policies of the Medical Department were determined at conferences attended by the few medical officers available at headquarters, or at more general conferences in which representatives of the Medical Department participated with those of other staff departments of the American Expeditionary Forces or with representatives of the French Army.⁹

A long step toward decentralization of medical service was taken when a chief surgeon was designated for the line of communications.¹⁶ The necessity for such an organization arose when the 1st Division arrived in July, and moved to its training area in the Vosges. The geographical limits of the line of communications extended from the sea to the point where supplies were delivered to the field transportation of the combat forces less such areas as might be excepted. Headquarters of this jurisdiction, while undergoing organization, was located in Paris, whence it moved January 13, 1918, to Tours.⁹

A colonel, Medical Corps, who arrived with a small force on July 18 was assigned as chief surgeon, line of communications,¹⁷ and was vested with immediate supervision of Medical Department personnel and transportation, base hospitals, sanitation, and supplies, in its jurisdiction.¹⁸ As his office was located in the same building as that occupied by the chief surgeon, A. E. F., numerous conferences occurred between their representatives¹⁹ until September 1, when the latter's office moved with headquarters, A. E. F., to Chaumont.⁴

A medical supply officer for the American Expeditionary Forces arrived on July 20 and proceeded to the base medical supply depot being established at Cosne.¹⁷ As additional personnel was now necessary in the office of the chief surgeon, A. E. F., and that of the chief surgeon of the line of communications the adjutants of the six American base hospitals already serving with the British (as mentioned in Chapter I) were relieved from duty therewith and ordered to Paris, where two of them were assigned to the office of the chief surgeon, A. E. F., and four to the office of the surgeon, line of communications.⁹ Also an American medical officer who had been serving at a French hospital at Ris Orangis and one who had been studying the organization of gas warfare in England were ordered to join the office of the chief surgeon, A. E. F.²⁰

Until the latter part of July, 1917, the chief surgeon's office, A. E. F., had not been divided into sections and none of its personnel had been assigned to particular duties exclusively.¹⁹ Nearly all of the work transacted had been of a character which required determination of broad general policies which were part of or conformed to the three important basic projects of the American Expeditionary Forces discussed in the preceding chapter.

As troops began to arrive in increasing numbers, more specific allocation of duties became necessary in the chief surgeon's office, in order that proper action might be taken promptly both on routine reports and on a number of diversified matters.⁹ For example, base hospitals which were arriving constantly had to be promptly and suitably located, arrangements had to be made with the French for the care or evacuation of American sick until our Medical Department establishments could care for them, the considerable numbers of casual personnel who were arriving had to be suitably classified and assigned, and many questions of policy on a wide range of subjects were now pressing for decision.⁹

After the arrival of a number of casual medical officers in the latter part of July the chief surgeon's office, A. E. F., was organized on the 28th of that month, as follows:²⁰

(1) An executive officer, who assisted the chief surgeon in supervision and coordination of the sections of his office, represented him when absent at conferences or on tours of inspection, and under the chief surgeon was in general charge of the administration of the medical service, A. E. F.

(2) *Hospitalization*.—In charge of location, construction, and repair and all other questions relating to hospitals; hospital trains; and the care of sick and wounded.

(3) *Sanitation and statistics*.—Sanitation of camps, quarters, and occupied territory, laundries, disinfection and disinfestation, collection and evacuation of sick, health of command, reports of sick and wounded, statistics and sanitary reports.

(4) *Personnel*.—Medical, Medical Reserve, Dental, and Veterinary Corps, enlisted force, schools of instruction, and civilian employees.

(5) *Supplies.*—Hospital equipment, medical, dental, and veterinary supplies, settlement of accounts, ambulances, and all motor transportation.

(6) Records and correspondence.

(7) *Chemical Warfare Service.*—Defensive gas, gas school, and all professional questions relating to gas.

There was but one officer on duty with each of the sections mentioned above except that the head of the hospitalization section (who was also charged with Franco-American liaison which is discussed in Chapter III) had a commissioned assistant.⁹ These officers also handled general estimates of personnel and equipment.⁹ Associated with this headquarters group was another officer who had been designated attending surgeon.⁹

During the week ending August 4, 1917, a liaison officer was appointed to function between the Medical Department and the coordination section of the general staff, an innovation which it was anticipated would greatly promote transaction of business between the two offices.²¹

The chief surgeon was also represented by a liaison officer at the headquarters of the American Red Cross and of the Young Men's Christian Association in Paris. He also maintained close contact with the other societies serving the American Expeditionary Forces and availed himself of their cooperation as circumstances indicated.²²

So much of the American Red Cross in Europe as was called into the service of the American Expeditionary Forces came under the immediate jurisdiction of the chief surgeon, A. E. F., though in the last analysis that and other like societies serving the American Expeditionary Forces were under the control of the first section of the general staff.²¹ The activities of the American Red Cross in the military service were quite diversified, but in very general terms they pertained especially to hospitalization and medical supply.

On August 23 a dental officer was assigned to duty in the chief surgeon's office and began, in the personnel division, the organization of the dental service of the American Expeditionary Forces.²⁴

After the chief surgeon's office had been moved from Paris to Chaumont, September 1, 1917, in the zone of the armies, it occupied the upper floors in the west end of the south barracks at that place.¹⁹ The floor space allotted here to the chief surgeon's office was many times as great as that which had just been vacated in Paris, for it was appreciated that a large increase in its personnel would soon be necessary.⁹ The chief surgeon's office when established in Chaumont included 10 commissioned officers of the Medical Department.²² Before leaving Paris, 4 officers were detached to remain in that city, 1 with the water service of the line of communications, 2 as liaison officers with the American Red Cross and the Young Men's Christian Association, respectively, and 1 who served both as the medical member of the general purchasing board, A. E. F., and later as liaison officer with the French Medical Department.²²

The Chemical Warfare Service was established as a separate bureau by General Orders, No. 31, G. H. Q., A. E. F., September 3, 1917, and to this a medical officer in close touch with the chief surgeon's office was later assigned.²⁵

On September 13, 1917, the chief surgeon was directed to submit at as early a date as practicable a project for the Medical Department for the next

six months covering the proposed location of medical depots, laboratories, hospitals, other establishments, and sanitary units, and his project for supplies and material.²⁶

On October 9, 1917, the chief surgeon submitted the following plan of organization of his office and that of the army surgeon at army headquarters in the field:²⁷



FIG. 2.—Wing B of group of three main buildings, general headquarters, A. E. F., in which the office of the chief surgeon, A. E. F., was located prior to its removal to Tours. This wing also was the location, subsequently, of the medical group, G-4, general staff, A. E. F.

	Major general	Briga- dier general	Colonel	Lieuten- ant colonel	Major	Captain or lieu- tenant	Clerks or soldiers
Chief surgeon.....	1						
Assistant to chief surgeon.....		1					
Personnel division.....			1	1	3		22
Sanitation and statistics.....		1	1	1			50
Records and correspondence.....					1		80
Hospitals, construction and assignment.....		1	2	3			100
Supplies.....			1				3
Total.....	1	3	5	5	4		253

Dental and veterinary service to be represented in this personnel section by an officer of the highest rank in these corps.

FOR ARMY HEADQUARTERS

1 brigadier general.
1 colonel.
1 lieutenant colonel.

1 major.
7 soldiers.

In reply to a communication from the adjutant general, the chief surgeon, on November 7, 1917, submitted the following statement of the subdivision of duties in his office, and of the personnel that would be required to staff them, viz, chief surgeon (1 officer), assistant to chief surgeon (1 officer), personnel division (5 officers, including 1 dental and 1 veterinary, and 22 clerks), sanitation and statistics (3 officers and 50 clerks), records and correspondence (1 officer and 80 clerks), hospital construction and administration (6 officers and 100 clerks), supplies (1 officer and 3 clerks).²⁸

On November 13, 1917, a chief nurse of the American Expeditionary Forces was designated and was assigned, with an assistant, to duty in the office of the chief surgeon, line of communications.²⁹ She and her assistant were not incorporated in the office of the chief surgeon, A. E. F., until it moved to Tours. This designation of the chief nurse later was changed to "director of nursing service," but her duties remained unchanged.³⁰

The following data concerning the chief surgeon's office formed a part of the table of organization for headquarters, A. E. F., office of the commander in chief, approved by General Pershing on December 22, 1917.³¹

Tables of organization, general headquarters, A. E. F.

CHIEF SURGEON'S SECTION

1	2	3	4	5	6	7	Remarks
Unit	Officers	Interpreters	Clerks	Soldiers ^c	Soldiers ^a	Total	
General officer.....	1					1	(a) Carried in headquarters battalion.
Colonels.....	3					3	(b) 1 chauffeur, 1 orderly for general officer.
Lieutenant colonels.....	5					5	
Majors.....	9					9	(c) All from Medical Department but attached to headquarters battalion for rations, pay, and clothing.
Captains or lieutenants.....	12					12	
Commissioned interpreters.....		2				2	(d) Clerks.
Total commissioned.....	30	2				32	(e) 3 chauffeurs, 5 clerks.
Field clerks.....			5			5	(f) 5 motorcyclists, 5 chauffeurs.
M. H. sergeants.....				5		5	(g) Pistols for 9 chauffeurs, 5 motorcyclists, 15 orderlies.
Hospital sergeants.....				5		5	
Sergeants major or battalion sergeants major.....					d 5	5	
Sergeants, first class.....				25		25	
Sergeants.....		a 4		52	b 2	58	
Corporals.....				20	c 8	28	
Privates, first class.....				63	f 10	73	
Privates.....				40	h 5, 12	52	
Total enlisted.....		4		210	37	251	
Aggregate.....	30	6	5	210	37	288	
Closed cars.....	1					1	
Touring cars.....	3					3	
Light cars.....	5					5	
Motor cycles, with side cars.....					2	2	
Motor cycles.....					3	3	
Bicycles.....					5	5	
Horses, riding.....	10					15	
Pistols.....					e 29	29	

RED CROSS SECTION (SERVICES VOLUNTEERED)

1	2	3	4	Remarks
Unit	Officers	Others	Total	
Captain.....	1		1	
Total commissioned.....	1		1	
Not commissioned.....		1	1	
Aggregate.....	1	1	2	
Motor cars.....	1		1	

With the development of the American Expeditionary Forces, decentralization had been necessary in practically every department. This movement was investigated and the following report on this subject in so far as it pertained to the chief surgeon's office was forwarded to it by the adjutant general, A. E. F., on January 10, 1918.³²

Statement of organization and personnel

Division	Officers	Clerks	Soldiers
Chief surgeon.....	1		
Personnel.....	^a 5		^b 10
Hospitalization.....	5		3
Supply.....	2		2
Sanitation and statistics.....	2		10
Records and correspondence.....	2	4	18
Dispensary.....	2		9
Dental office.....	2		2
	21	4	54

^a Two Veterinary Corps (temporary duty).

^b Sorting mail.

Personnel division.—This division keeps record of all the personnel of the Medical Corps, regular or otherwise, hospital corps sergeants, and nurses, on duty in France. Most of the records concerning personnel are kept on cards; these cards give name of college, date of graduating; whether medicine, dental or veterinary surgery; previous military service and date of appointment and call into active service; and special character of professional work; also specialty and ability to speak or translate French. These cards are made out in cases of all Medical Reserve Corps men. All medical personnel arriving in France are now assigned to duty from this office. When the system of automatic replacements is put into effect this work should be decentralized to the line of communication.

Hospitalization.—This division handles all questions relating to the establishing of hospitals in France. The selection of sites are passed upon by the general staff at these headquarters after conference with the French mission. It is not seen how this can be divorced from the office of the chief surgeon. The actual building and plans, etc., are now decentralized to the line of communications.

Sanitation and statistics.—All reports concerning sanitation, sick and wounded, etc., from the medical sections of all units come to this office. Statistics and reports are made up concerning them; also the weekly report to the commander in chief. If the statistical bureau is established at these and other headquarters, it is believed with representative of the Medical Department serving thereat that most sanitary reports and reports of sick and wounded could come to this bureau.

There is a certain amount of data though which should, in my opinion, come to the chief surgeon, who after all is responsible for the evacuation of sick and wounded and their care, and it is believed that in case of heavy casualties or epidemic the chief surgeon at these headquarters should receive the necessary data in order to enable him to understand the situation. Practically, the evacuation of sick and wounded will be automatic, but in times of emergency, the chief surgeon may have to act and exercise supervision over situations, and he must be kept informed as to the general situation. It is not necessary for him to have all the information in detail that is required for final reports to Washington. Data required for furnishing reports to the commander in chief should come to the statistical bureau at these headquarters. Others which are only required for the chief surgeon's office in Washington could be sent to the statistical bureau at the headquarters, line of communications, it is believed.

Records and correspondence.—When the automatic replacement is put into effect much of the records and correspondence work will naturally go from the chief surgeon's office to the depots of the line of communications.

There is a post office here in which is distributed all the mail for the personnel of the Medical Department serving in France. It is recommended that immediate steps be taken to have the mail distributed elsewhere, and that only mail for the personnel on duty in the Medical Department at these headquarters be forwarded here.

To this the chief surgeon replied as follows, on January 12: ³³

1. The receipt is acknowledged of your letter of January 10th (4773-F).

2. *Personnel division*.—Every effort has been made since arriving in France to keep the amount of work in the personnel division in this office down to the minimum. As the inspector says, there is a card in this office for every member of the Medical Department. It contains only the minimum amount of information. I protest most emphatically against any proposition to remove this information from my office. It is utterly impossible for the chief surgeon of the American Expeditionary Forces to administer his office without knowing the personnel he has available. I am not at all concerned in regard to the automatic assignment of personnel arriving in France except in such instances where it is absolutely necessary that it shall be done from these headquarters. It wish to emphasize again that I would consider it the greatest misfortune to bring details into my office which can be handled elsewhere: These details have been given to the line of communications and to the different divisions wherever it was possible to do so. This has been carried to such an extent that personal complaints have actually been made from two of the divisions that they felt very materially the loss of contact with the chief surgeon's office.

3. *Hospitalization*.—This paragraph hardly calls for remark except that I am not prepared to state now that I agree with the statement of the inspector that the hospital division should rest entirely in this office. This is a question that had been up many times since these headquarters moved to Chaumont. It is being studied now and if improvement on present conditions can be made it will be promptly reported to proper authorities.

4. *Sanitation and statistics*.—I am perfectly willing to remove from this office as much of this division as is possible, having in mind particularly routine sick and wounded reports, with the understanding that I be furnished with the information necessary to administer the office. Attention is invited to the fact that the chief surgeon can not carry out his functions without knowing the sick rate, the prevalence of epidemic diseases and the sanitary conditions of the troops.

5. *Record and correspondence*.—It is hoped that the automatic replacement will relieve this office of a great deal of the record and correspondence, and I will welcome any change in this respect which will not decrease efficiency.

6. *Mail*.—The distribution of mail which is being done in this office was not of my choice; it was forced upon the Medical Department. The condition which exists in this respect to-day is almost intolerable and I will welcome any proposition which will take this matter out of my office. It appears to me that this is a serious matter in the American Expeditionary Forces. Attention is invited to the great dissatisfaction which will be continued throughout the command if the delivery of mail, now so much delayed, is not accomplished with greater expedition.

Until February 14, 1918, there had been no general medical inspectors in the American Expeditionary Forces, but on that date two experienced officers were assigned to this duty. Though these officers functioned in the division of sanitation, chief surgeon's office, their reports considered the entire range of Medical Department responsibilities.³⁴

On February 16, the date General Orders, No. 31, was published, reorganizing the American Expeditionary Forces, the chief surgeon's office included 19 officers, 55 clerks, and 4 orderlies. These were distributed as follows: ³⁴ Chief surgeon; personnel section, 2 officers, 11 clerks; dental, 1 officer, 1 clerk; hospitalization, 5 officers, 5 clerks; supplies, 1 officer, 3 clerks; sanitation and statistics, 4 officers, 13 clerks; records and correspondence, 2 officers, 17 clerks, 4 orderlies; veterinary, 2 officers; mail, 4 clerks; property, 1 officer, 1 clerk.

On February 22, the chief surgeon's office reported that in conformity with the order mentioned above, 16 officers, 47 enlisted men, and 4 civilians, would move to Tours.³⁵

By General Orders, No. 31, G. H. Q., A. E. F., February 16, 1918, the Medical Department was charged with the following duties: Sanitary inspection; health of command; care of sick and wounded; collection and evacuation of sick and wounded; medical supplies; veterinary supplies; supply of personnel and material for gas defense under supervision of director of gas service; technical inspection of medical organizations and establishments.

In reply to a query from the general staff, A. E. F., concerning the personnel that would be required by the chief surgeon's office³⁶ in the tables of organization for the Services of Supply, the chief surgeon, on March 8, 1918, submitted the following estimate:³⁷

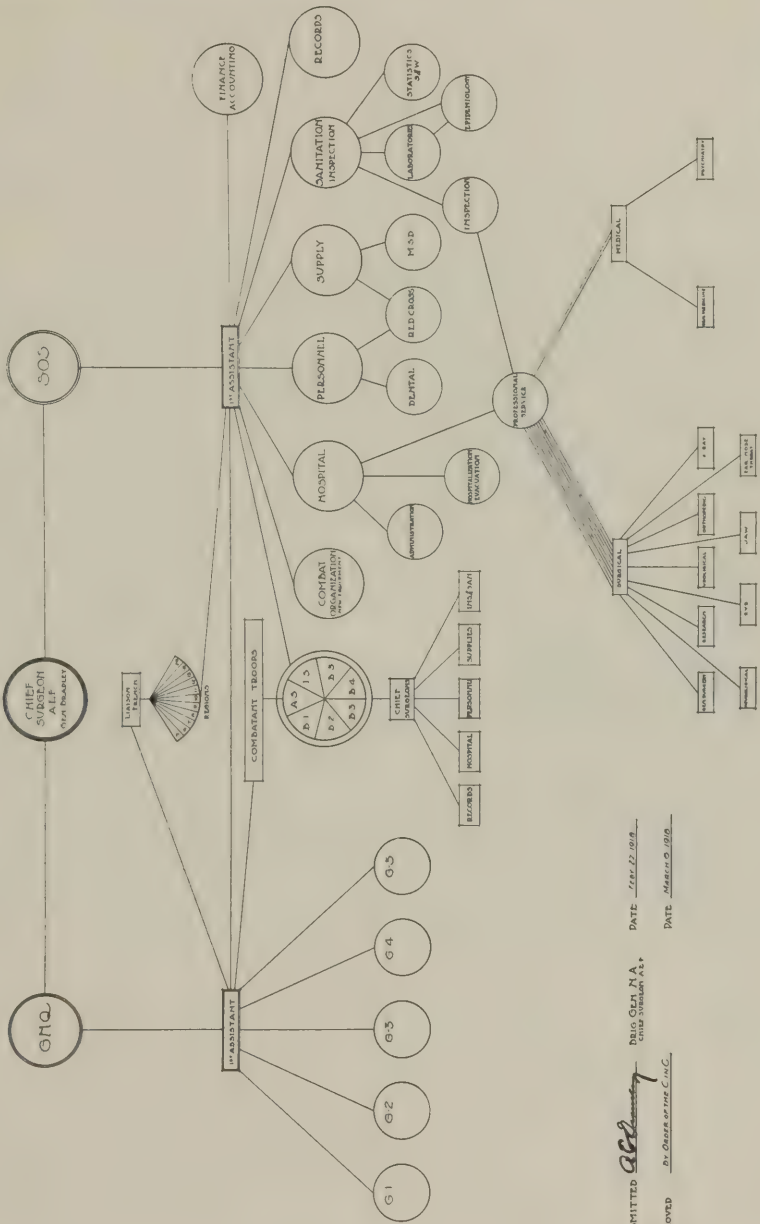
Tables of organization, chief surgeon's office, A. E. F., Services of Supply

Unit	Officers	Inter- preters	Clerks	Sol- diers ^c	Sol- diers	Total	Remarks
General officer	1					1	(a) Carried in headquarters battalion.
Colonels and lieutenant col- onels	15					15	(b) 1 chauffeur, 1 orderly for general officer.
Majors	20					20	(c) All from Medical Department, but attached to headquarters battalion for rations, pay, and clothing.
Captains or lieutenants	15					15	(d) Clerks.
Commissioned interpreters		2				2	(e) 3 chauffeurs, 5 clerks.
Total commissioned	51	2				53	(f) 5 motorcyclists, 5 chauffeurs.
Field clerks			5			5	(g) Pistols for 9 chauffeurs, 5 motorcyclists, 15 orderlies.
Master hospital sergeants				5		5	
Hospital sergeants				5		5	
Sergeants major or battalion sergeants major					d 5	5	
Sergeants, first class				25		25	
Sergeants		a 4		52	b 2	58	
Corporals				20	e 8	28	
Privates, first class				63	f 10	73	
Privates				40	12	52	
Total enlisted		4		210	37	251	
Aggregate	51	6	5	210	37	309	
Closed cars	1					1	
Touring cars	3					3	
Light cars	5					5	
Motor cycles with side cars					2	2	
Motor cycles					3	3	
Bicycles					5	5	
Horses, riding	10				5	15	
Pistols					g 27	27	

In compliance with General Orders, No. 31, G. H. Q., A. E. F., February 16, 1918, the chief surgeon's office arranged for removal of most of its personnel, records, and property, on the night of March 20, to Tours, where it was installed March 21.³⁸ Here it absorbed and superseded the office of the chief surgeon, line of communications. On March 24, the office force of the chief surgeon, A. E. F., included 33 officers and 2 nurses.³⁸

The organization prescribed by the chart approved by the commander in chief on March 6, 1918, was in general that followed in subsequent developments.³⁹ The section charged with combat organization and new equipment was taken over by the representatives whom the chief surgeon left with the general staff at Chaumont, before he moved his office to Tours on March 21.⁴⁰ The nomenclature of the records division was later changed to administrative division, but its duties were unchanged.⁴¹

SCHEME FOR ORGANIZATION OF
MEDICAL DEPARTMENT
A.E.F.



SUBMITTED *all* DATE *12/12/18*
BY *DR. OLIN N.A.*
CHIEF SURGEON A.E.F.
APPROVED *Dr. OLIN N.A.* DATE *12/12/18*

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CHART I.—Showing organization of chief surgeon's office, A. E. F., March 6, 1918

The chiefs of the 10 technical staff departments of headquarters, A. E. F., who were transferred by General Orders, No. 31, 1918, to Tours, were now under the immediate jurisdiction of commanding general, Services of Supply, in all matters pertaining to procurement, supply, transportation, and construction, but retained their titles and authority as members of the staff of the commander in chief, A. E. F.⁴² They were directed so to organize their offices that the efficiency of their departments would not be impaired by absences for conferences or other duties assigned them, and though their headquarters were at Tours they were authorized and expected to travel throughout the American Expeditionary Forces to investigate, direct, and supervise the work of all elements of their services, including those with combat units. The chief surgeon thus occupied a dual status, for he was at once the chief surgeon of the American Expeditionary Forces and of the Services of Supply.⁴²

In the Services of Supply the position of the chief surgeon in relation to the general staff of that command, and with the heads of its administrative staff departments, was altogether analogous to that which as chief surgeon, he formerly had held with the corresponding departments of general headquarters, A. E. F., at Chaumont.⁴² In fact, as stated in the preceding chapter, the chiefs of all administrative staff departments, A. E. F., except the adjutant general, the judge advocate, and inspector general, A. E. F., had also been transferred to Tours where they had the same dual status as had the chief surgeon.⁴² With the adjutant general, judge advocate, and inspector general of the Services of Supply his relations were the same as with the chiefs of the other staff departments, but the scope of the Medical Department matters upon which they took definitive action pertained to the Services of Supply only.⁴² Though the chief surgeon was represented on the general staff, A. E. F., at Chaumont, by medical officers assigned to several of its sections, he was not represented on the general staff of the Services of Supply at Tours except for a short period when a medical officer was assigned to its first section.⁴³ Over his subordinates in the several geographical sections (advance, intermediate, and base) into which the Services of Supply was divided, the chief surgeon exercised supervision through the section surgeons who were members of the staffs of the officers commanding those sections.¹⁶ His office had direct control, except in a few matters (especially discipline) over certain Medical Department formations which were removed from the jurisdiction of the commanding officer of the section in which they were located; e. g. hospital centers, detached base hospitals, medical supply depots, the central Medical Department laboratory, Dijon, and such hospital trains as were assigned to his office.

The chief surgeon's office, after its location at Tours and its absorption of the office of the surgeon, line of communications, was organized into the following divisions:⁴⁴ (1) General administration, records and correspondence; (2) hospitalization, evacuation, and hospital administration; (3) sanitation, sanitary inspection, and medical statistics; (4) personnel; (5) medical supplies; (6) finance and accounting.

Under the chief surgeon and his executive officer, the commissioned personnel of the chief surgeon's office was distributed among its several divisions, on March 24, 1918, as follows:³⁸ Sanitation, 7; hospitalization, 6; personnel, 4; supplies, 4; records and correspondence, 4; finance and accounts, 6.

A chief nurse and assistant chief nurse were at the head of the nursing service in the personnel division, but members of the nursing staff were not yet commissioned.³⁸

The assistant to the chief surgeon examined all papers going to the chief surgeon for his signature and was authorized to sign these in his absence.⁴⁴ The finance and accounting section was composed of personnel recently arrived, who had been selected from a unit that had been organized in the United States to audit property and money accounts of the Medical Department in France.⁴⁴

By June 3, 1918, the clerical force in the office of the chief surgeon had grown materially, but was inadequate and on that date he recommended that because of the great number of technical questions reaching his office and the



FIG. 3.—Headquarters, Services of Supply, A. E. F., at Tours, viewed from within. The chief surgeon's office occupied practically the entire first floor of the wing on the right

consequent necessity for trained noncommissioned officers, the enlisted personnel on duty therein should be authorized in the following proportions:⁴⁵ Master hospital sergeants, 2; hospital sergeants, 12; sergeants, first class, 35; sergeants, 60; corporals, 26; privates, first class, 40; privates, 27; total, 202. This number was exceeded by the latter part of July, 1918, for at that time the personnel then on duty in the chief surgeon's office was 43 officers and 220 clerks.⁴⁶

A seventh section of the veterinary service, was organized in the chief surgeon's office after the promulgation of General Orders, No. 139, on August 29, 1918.³⁰ Before publication of that order, this activity had been under the control of the remount service of the Quartermaster Department, its chief being

without administrative authority and having virtually the status of a technical adviser only.³⁰ The general order mentioned, provided that the veterinary service be transferred to the Medical Department and that a new section charged with direction of veterinary affairs be created in the chief surgeon's office of which the chief veterinarian was, therefore, placed in charge.³⁰

After its expansion by the addition of the veterinary division the chief surgeon's office retained the general organization then provided though its personnel steadily increased in number until after the armistice was signed.³⁰

On November 9, 1918, 58 officers were on duty in the chief surgeon's office, distributed as follows:⁴⁷ Chief surgeon, 1; assistant to chief surgeon, 1; general administration, 1; detachment of enlisted men, Medical Department, 1; records, 1; library, 4; hospitalization, 13 (transportation, 7; sick and wounded, 5);



FIG. 4.—Building in Tours, in which the finance and accounting division of the chief surgeon's office was located

sanitation, 4 (sanitary inspection, 1); personnel, 4 (dental, 5; promotions, 1); supplies, 5; finance and accounts, 4; veterinary, 6.

Other personnel who were in charge of specialties in the chief surgeon's office but who were not commissioned included nurses and dietitians. It will be noted that 25 of the 61 officers whose duties were classified above—i. e., more than 40 per cent—were serving in the hospitalization division.⁴⁷

The personnel serving in the chief surgeon's office or in immediate connection therewith on November 11, the date the armistice was signed, were distributed by rank as follows:⁴⁸ Officers: Brigadier generals, 2; colonels (one being the chief surgeon, later promoted), 6; lieutenant colonels, 12; majors 6; captains, 9; first lieutenants, 27; second lieutenants, 6. Total, 68.

Nursing service: Nurses, 2; enlisted men: Master hospital sergeants, 1; hospital sergeants, 21; sergeants, first class, 55; sergeants, 83; corporals, 46; cooks, 3; privates, first class, 26; privates, 43. Total, 278. Civilian employees, 76; grand total, 424.

PERSONNEL

(July 28, 1917, to July 15, 1919)

CHIEF SURGEON, A. E. F.

Brig. Gen. Alfred E. Bradley, M. C., to April 30, 1918.

Maj. Gen. Merritte W. Ireland, M. C., May 1 to October 9, 1918.

Brig. Gen. Walter D. McCaw, M. C., October 10, 1918, to July 15, 1919.

DEPUTY CHIEF SURGEON

Brig. Gen. Jefferson R. Kean, M. C.

Brig. Gen. Francis A. Winter, M. C.

REFERENCES

- (1) Letter from the Surgeon General, U. S. Army, to The Adjutant General of the Army, May 10, 1917. Subject: Designation of Col. Alfred E. Bradley, M. C., as chief surgeon, United States forces in Europe. On file, Record Room, S. G. O. (9795).
- (2) Letter from The Adjutant General of the Army, to Col. Alfred E. Bradley, M. C., American Embassy, London, May 28, 1917. Subject: Designation as chief surgeon of the United States forces in Europe. On file, Record Room, S. G. O. (9795).
- (3) Letter from the chief surgeon, A. E. F., to the Surgeon General, U. S. Army, June 11, 1917. Subject: Status. On file, Record Room, S. G. O. (9795).
- (4) Report from the chief surgeon, A. E. F., to the commanding general, A. E. F. (undated). Subject: Outline report of chief surgeon, A. E. F., for use in preparation of the report of the commander in chief. On file, Historical Division, S. G. O.
- (5) Letter from The Adjutant General of the Army, to Col. A. E. Bradley, M. C., May 29, 1917. Subject: Assignment. On file, Record Room, S. G. O. 9785 (Old Files).
- (6) Memorandum from the chief surgeon, A. E. F., to Maj. W. J. L. Lyster, M. C., American Embassy, London, June 11, 1917. Subject: Administration of American medical personnel serving with British Forces. On file, Record Room, S. G. O., 9795 (Old Files).
- (7) Final report of Gen. John J. Pershing, September 1, 1919, 5.
- (8) Letter from the chief surgeon, A. E. F., to the commander in chief, A. E. F., June 21, 1917. Subject: Report of personnel of chief surgeon's office. On file, A. G. O., World War Division, chief surgeon's files (321.6).
- (9) Wadhams, Sanford H., Col., M. C., and Tuttle, Arnold D., Col., M. C.: Some of the Early Problems of the Medical Department, A. E. F. *The Military Surgeon*, Washington, D. C., 1919, xlv, No. 6, 636.
- (10) Memorandum from the chief surgeon, A. E. F., to the chief of staff, A. E. F., July 14, 1917. Subject: Weekly war diary. Copy on file, Historical Division, S. G. O.
- (11) Special Orders, No. 26, Headquarters, A. E. F., July 4, 1917, par. 2.
- (12) Report from Col. Sanford H. Wadhams, M. C., the Representative of the chief surgeon, A. E. F. with the General Staff G-4-"B" to the chief of the fourth section, general staff, general headquarters, A. E. F., December 31, 1918. Subject: Activities of the medical group, fourth section, general staff, A. E. F., for the period embracing the beginning and end of America's participation in hostilities. Copy on file, Historical Division, S. G. O.

- (13) Final report from the adjutant general, A. E. F., to the commander in chief, A. E. F., from May 28, 1917, to April 30, 1919. On file, General Headquarters, A. E. F. Records.
- (14) General Orders, No. 42, G. H. Q., A. E. F., September 26, 1917.
- (15) Memoranda from the chief surgeon, A. E. F., to the chief of staff, A. E. F., from July 14, 1917, to and including December 29, 1917. Subject: Weekly war diaries. On file, Historical Division, S. G. O.
- (16) General Orders, No. 20, G. H. Q., A. E. F., August 13, 1917; also memorandum from the chief surgeon, A. E. F., to the chief of staff, A. E. F., July 21, 1917. Subject: Weekly war diary. On file, Historical Division, S. G. O.
- (17) War diary, chief surgeon's office, A. E. F., July 21, 1917.
- (18) Report of medical activities, line of communications, A. E. F., during the war period (undated), by Brig. Gen. Francis A. Winter, M. C. On file, Historical Division, S. G. O.
- (19) Report on medical supply, A. E. F. (not dated), by Maj. A. P. Clark, M. C. On file, Historical Division, S. G. O.
- (20) War diary, chief surgeon's office, A. E. F., July 28, 1917.
- (21) War diary, chief surgeon's office, A. E. F., August 4, 1917.
- (22) War diary, chief surgeon's office, A. E. F., September 2, 1917.
- (23) General Orders, No. 8, G. H. Q., A. E. F., July 8, 1917.
- (24) War diary, chief surgeon's office, A. E. F., August 26, 1917.
- (25) Report from the chief surgeon, A. E. F., to the Surgeon General, U. S. Army, May 1, 1919. Subject: Activities of the chief surgeon's office, A. E. F., to May 1, 1919. On file, Historical Division, S. G. O.
- (26) Memorandum from the adjutant general, A. E. F., to the chief surgeon, A. E. F., September 13, 1917. Subject: Project of Medical Department. On file, A. G. O., World War Division, chief surgeon's files (321.6).
- (27) Memorandum from the chief surgeon, A. E. F., to the chief of staff, October 9, 1917. Subject: Tables of organization. On file, A. G. O., World War Division, chief surgeon's files (320.2).
- (28) Memorandum from the chief surgeon, A. E. F., to the adjutant general, A. E. F., November 7, 1917. Subject: Chart showing subdivisions in his office. On file, A. G. O., World War Division, chief surgeon's files (320.2).
- (29) Personnel records. On file, Army Nurse Corps, S. G. O. (Bessie S. Bell).
- (30) Report from the chief surgeon, A. E. F., to the commanding general, A. E. F., April 17, 1917. Subject: Activities of the Medical Department, A. E. F., to November 11, 1918. On file, Historical Division, S. G. O.
- (31) Tables of organization for general headquarters, A. E. F., in France, approved by Gen. John J. Pershing, December 22, 1917. On file, A. G. O., World War Division, chief surgeon's files (320.2).
- (32) Letter from the adjutant general, A. E. F., to the chief surgeon, A. E. F., January 10, 1918. Subject: Report on investigation of methods of decentralization. On file, A. G. O., World War Division, chief surgeon's files (321.6).
- (33) Letter from the chief surgeon, A. E. F., to the adjutant general, A. E. F., January 12, 1918. Subject: Report of investigation of methods of decentralization. On file, A. G. O., World War Division, chief surgeon's files (321.6).
- (34) List of officers and clerks on duty in the chief surgeon's office, February 16, 1918. On file, A. G. O., World War Division, chief surgeon's files (321.6).
- (35) Memorandum from the chief surgeon, A. E. F., to the post quartermaster, February 22, 1918. Subject: Transfer to Tours. On file, A. G. O., World War Division, chief surgeon's files (321.6).
- (36) Memorandum from assistant chief of staff, G-3, A. E. F., to the chief surgeon, A. E. F., February 26, 1918. Subject: Tables of organization for the service of the rear. On file, A. G. O., World War Division, chief surgeon's files (320.2).
- (37) Letter from the chief surgeon, A. E. F., to the commanding general, S. O. R., A. E. F., March 8, 1918. Subject: Tables of organization. On file, A. G. O., World War Division, chief surgeon's files (320.2).

- (38) War diary, chief surgeon's office, A. E. F., March 24, 1918.
- (39) Scheme for organization of the medical department, submitted by the chief surgeon, A. E. F., February 22, 1918, and approved by the commander in chief, A. E. F., March 6, 1918. On file, A. G. O., World War Division, chief surgeon's files (321.6).
- (40) Letter from the chief surgeon, A. E. F., to the commander in chief, A. E. F., March 15, 1918. Subject: Organization. On file, A. G. O., World War Division, chief surgeon's files (320.2).
- (41) Report on the administrative section of the chief surgeon's office, A. E. F., by Capt. R. A. Dickson, M. A. C. On file, Historical Division, S. G. O.
- (42) General Orders, No. 31, G. H. Q., A. E. F., February 16, 1918.
- (43) Report from Col. N. L. McDiarmid, M. C., to the Surgeon General, U. S. A., May 1, 1919. Subject: Activities of the supply division, chief surgeon's office, A. E. F. On file, Historical Division, S. G. O.
- (44) Report from the chief surgeon, A. E. F., to the commanding general, A. E. F., July 1, 1918. Subject: The Medical Department in the American Expeditionary Forces to May 31, 1918. On file, Historical Division, S. G. O.
- (45) First indorsement from the chief surgeon, A. E. F., to the assistant chief of staff, G-1, A. E. F., June 3, 1918, on memorandum from assistant chief of staff, G-1, A. E. F., to chief surgeon, A. E. F., May 31, 1918. Subject: Table of organization. On file, A. G. O., World War Division, chief surgeon's files (320.1).
- (46) Memorandum from the chief surgeon, A. E. F., to assistant chief of staff, G-4, A. E. F., July 4, 1918. Subject: Office personnel and space. On file, A. G. O., World War Division, chief surgeon's files (321.6).
- (47) Circular No. 54, chief surgeon's office, A. E. F., November 9, 1918. On file, Historical Division, S. G. O.
- (48) Memorandum from the chief surgeon, A. E. F., to assistant chief of staff, G-1, A. E. F., December 2, 1918. Subject: Personnel and transportation. On file, A. G. O., World War Division, chief surgeon's files (321.6).

CHAPTER II

REPRESENTATION OF THE MEDICAL DEPARTMENT ON THE GENERAL STAFF, A. E. F.

Before the organization of the American Expeditionary Forces little attention had been given to the subject of Medical Department representation on the general staff, but as early as July, 1917, it became apparent that such representation was essential for coordinated action.¹ A memorandum was formulated on this subject at this time but no action resulted.¹ In February, 1918, in conformity with a request of the commander in chief for frank discussion, another memorandum was prepared, again inviting attention to the necessity for Medical Department representation on the general staff and stating the reasons for this.¹ But until February 16, 1918, when General Orders, No. 31, general headquarters, A. E. F., was published, representatives of the chief surgeon's office continued to take up with the section of the general staff concerned, all Medical Department matters which required their coordination or execution.¹

When the American Expeditionary Forces were reorganized, as described in Chapter I, the chiefs of the 10 technical staff services (including the Medical Department) which were transferred from headquarters, A. E. F., at Chaumont, to that of the Services of Supply at Tours, were authorized in their discretion to designate officers of their respective services to represent them with each general staff section at general headquarters.² In conformity with this plan the chief surgeon, on February 22, 1918, recommended that certain officers of the Medical Department remain at general headquarters to represent him with the several sections of the general staff.³ As his immediate representative he designated a medical officer who was also the liaison officer with the central bureau of the Franco-American section and with the French mission at general headquarters. The office force left to assist this officer consisted of two officers of the Sanitary Corps and eight clerks.³ The medical officers who were assigned as assistants to the chief surgeon's representative were attached to the several sections of the general staff as follows: One to G-1, 1 (who was also attending surgeon at general headquarters) to G-2, 1 to both G-3 and G-5, and 2 to G-4.³ The chief surgeon stated that when more medical officers were available one would be attached to G-3 and another to G-5 instead of having one officer attached to both these sections, but this plan was never realized.³ By May, 1918, representation with the second section of the general staff was found to be unnecessary and was discontinued.⁴

There was also assigned to duty with the chief surgeon's representative at Chaumont, an officer who was designated director of professional services.⁴ He was not attached to any section of the general staff, but was stationed at Chaumont largely to lend him the facilities needed in administering his important activities.⁴

Technically the medical officers who were assigned to duty with the several sections of the general staff at general headquarters were assistants to the chiefs of those sections, but from another point of view they were, as stated above, assistants to the chief surgeon's representative there.¹

On March 15, 1918, the chief surgeon endeavored to have created a Medical Department section of the general staff. His letter on the subject is as follows:⁵

Recently there has been a considerable readjustment in the organization of these headquarters. It is stated in General Orders, 31, c. s., that the organization there prescribed had been arrived at after a careful study of both the French and British Armies. The American Expeditionary Forces organization recently adopted resembles very closely the French organization which has been in existence for some time.

It is pertinent to review briefly a few of the more important steps in the development of the French organization since the beginning of the war especially in reference to its sanitary service. It was early found necessary to provide for Medical Department representation in the Government, and this was done by creating the office of *sous secrétaire d'état du service de santé*. Gradually it was learned by bitter experience that in order to insure coordination of effort and the prevention of unnecessary sacrifice of life actual medical department participation in the plans for combat activities was necessary; that is, representation on the general staff. Consequently, several medical officers were assigned to the general staff of the G. Q. G. and one to the general staff of each army.

While better coordination was secured the results were not entirely satisfactory. Since the Champagne offensive of April, 1917, which was accompanied with a terrible death toll and very great unnecessary suffering there has been a growing feeling that steps should be taken to prevent the recurrence of a similar catastrophe. It was well recognized that a repetition of this unfortunate occurrence might well have a profound and possible disastrous effect on the morale of a people already exhausted and harassed by the unavoidable hardships of a long war.

During the past three and one-half years many changes in organization have been found necessary, changes which viewed in the light of pre-war days seem radical. All of these changes have tended toward a more complete autonomy of the medical service, and it is believed by the best thinkers in the French Army that a high degree of autonomy is essential if the Medical Department is to successfully meet the conditions which modern warfare have imposed upon it.

The latest change in the Medical Department organization in the French Army has very recently been published under date of February 26, 1918 (see inclosures). This change is so fundamental in character and so far-reaching in its consequence that I feel impelled to bring it to your attention. By this change the Medical Department had been removed from the close administrative control of the fourth bureau of the general staff. I am informed that M. Clémenceau and General Pétain have decided, in order that the medical service may have every possible opportunity to accomplish the difficult task with which it is confronted, to constitute a new section of the general staff of the G. Q. G. This section is designated the *service de santé*, and has as its chief an experienced officer of the Medical Corps who is an assistant chief of staff.

It seems particularly fitting at this time that inasmuch as our present organization is modeled so closely on that of the French that we should not appear as having begun our military effort with a medical organization which has been found wanting and has been discarded by the French. Undoubtedly this step has been taken by the French after most mature study, and with the experience of three and a half years of war as a guide. I feel it incumbent upon me to urge careful consideration of this matter and to recommend that a similar organization be adopted for the A. E. F. If this recommendation is approved, as I feel it must be sooner or later, it is my intention to request the detail of one of the several experienced senior officers of the Medical Corps now in France as chief of this section. I am convinced that while the recently prescribed organization is a vast improvement over that which has been in effect, the gain in saving of life and the prevention of unnecessary suffering which may reasonably be expected from adopting the proposed change will be immeasurably

greater. The present organization in the American Expeditionary Forces places a line officer of the general staff in position to pass upon or present for higher consideration all matters of fundamental policy affecting the Medical Department. He can nullify the most carefully worked out program having for its object Medical Department efficiency. I am convinced that proper coordination of the medical service with the troops in the zone of the armies can be secured in no other way than that outlined above.

This matter was referred to the chief of the fourth section, general staff, who reported upon it adversely;⁶ however, the chief surgeon, on April 30, renewed his recommendation in the following letter:⁷

On the 15th of March, 1918, a letter was sent you from this office calling attention to the fact that the Medical Department was handicapped in its extensive and complex operations by being cut off from direct access to the chief of staff and having to operate through two divisions of the general staff, and suggesting that a remedy be found in the creation of a medical section of the general staff.

In the six weeks which have elapsed since that letter was forwarded, the transfer of the chief surgeon's office to the Services of Supply has been tested in actual operation, and has in many ways greatly facilitated the transaction of business, especially in matters concerning supplies, the distribution and training of personnel, and the construction of the hospital accommodations for the great Army which is being transferred from the camps of mobilization at home to France.

It becomes daily more apparent, however, that it has resulted in a disconnection of the chief surgeon's office from the medical administration of the front to an extent which makes it practically impossible for the chief surgeon to meet his responsibility for the conduct of medical affairs in the zone of the army.

It is requested, therefore, that a reply be made to this letter, stating the action taken with regard to it and, if unfavorable, the reasons which rendered favorable action inexpedient. It is hoped that by a study of these reasons a solution may be arrived at which may be acceptable to the commander in chief and may relieve the very serious administrative difficulties which now exist.

As the chief surgeon was never informed officially of the objections, he was not in a position to discuss them. This matter lapsed and no Medical Department section of the general staff, comparable to that of the French Army was, created at this time or later.¹

None of the medical officers attached to the general staff became members of that body until some time later. By General Orders, No. 73, G. H. Q. A. E. F., May 10, 1918, two of them were detailed acting general staff officers, and by General Orders, No. 138, G. H. Q., A. E. F., August 23, 1918, the same official status was given two others.

The representative of the chief surgeon, at general headquarters, established his office with that of the two medical officers assigned to the fourth section of the general staff.⁸ This section as described in Chapter I, was concerned with supply and transportation in the American Expeditionary Forces, initial troop movements, hospitalization, evacuation, utilities, and labor.² It formulated policies in these matters; the Services of Supply or other agency executed them.¹ The assistant chief of staff, G-4, organized in his office a subsection, the medical section, designated "G-4-B," which was charged with Medical Department affairs, and it was with the group composing this section that the chief surgeon's representative identified himself.¹

Composition of the medical section, G-4, varied according to circumstances, but on the average included four medical officers of field rank, two officers of the Sanitary Corps for office management, and a small clerical force.¹

On May 2, 1918, the Medical Department officers on duty at headquarters consisted of the representative of the chief surgeon and one assistant, one officer attached to G-1, one attached to G-3 and to G-5, two attached to G-4, an assistant to these last mentioned, who was in charge of records, a director of professional services and his assistant.⁴

With the separation of the chief surgeon's office from general headquarters, A. E. F., the chief surgeon's relations with the combat forces virtually ceased, but no agency was formally provided for the control, direction, or supervision of Medical Department activities in the zone of the armies.¹ Therefore, his representative at general headquarters supervised all activities of the Medical Department during combat.¹ Demands upon the medical section, G-4, constantly grew, for it soon became the center to which were referred all matters affecting the Medical Department, whether they arose at headquarters, A. E. F. or were referred to it from other sources for recommendation or suitable action.¹ Except in matters pertaining to priority shipments of supplies and personnel from the United States, training, equipment, and operations, this fourth section controlled most of the policies of the Medical Department, not only in the Services of Supply, but throughout the American Expeditionary Forces, including the zone of the armies.¹ It was for this reason that the representative of the chief surgeon had identified himself intimately with this section.¹ Gradually nearly all the Medical Department activities at general headquarters were coordinated under the medical section, G-4, and no important questions of policy were decided until they had been examined by this group.¹ The medical officer assigned to G-1 actually served as a member of this group, but was placed with G-1 to handle certain specific problems pertaining to ocean tonnage which were under control of that section.¹ All actions initiated in the group were of course executed over the signature of the assistant chief of staff, G-4. This system was followed, even with questions involving another section.¹ In this case a memorandum was usually prepared for the other section of the general staff involved, and transmitted to it through the assistant chief of staff, G-4.¹

Orders affecting Medical Department activities in the Services of Supply were promulgated from that headquarters at the direct instance of the chief surgeon, A. E. F., while those affecting service of the Medical Department in the American Expeditionary Forces as a whole, as well as in the zone of the armies, were issued, on request of the chief surgeon's representative, from general headquarters at Chaumont.³

Before they made recommendations concerning the establishment of policies or took action upon them, the representatives of the chief surgeon invariably submitted them to him for approval.⁸ Daily at 8 a. m., and oftener in emergencies, the chief surgeon and his deputy discussed by long-distance telephone the problems demanding solution.⁸ Mail sent by courier from one office to the other reached its destination in 12 hours. By these means and by semimonthly visits to Chaumont for the purpose of attending conferences, the chief surgeon kept constantly in touch with the activities and interests of the Medical Department at general headquarters, and was able to supervise Medical Department activities in the zone of the armies and in the American Expeditionary Forces as a whole.⁸

The medical officers assigned to duty with G-4 previously had been identified with the hospitalization division of the chief surgeon's office, and in that capacity had dealt with G-4 directly in matters pertaining to hospital procurement.¹ As a part of such procurement they had sought to make provision for field and evacuation hospitals as well as for the base hospitals in the Services of Supply.¹ Also they had supervised and directed evacuation of patients from divisions in training areas and in quiet sectors. Therefore, it developed that the medical section, G-4, handled all questions relating to hospitalization, evacuation, and other interests of the Medical Department throughout the American Expeditionary Forces which required the attention of general headquarters.¹ One very important detail of its service was the prosecution of construction and procurement program, in its relation to hospitalization and depot policies of the chief surgeon's office.¹ Another was support of Medical Department interests when in certain projects these conflicted with those of another branch of the service.¹ After American troops began to participate in active operations the duties of this group underwent a tremendous increase in scope for it was then charged with general control of Medical Department activities in the field.¹ Questions continued to arise in connection with the hospitalization and evacuation policies of the Services of Supply, but aside from these the group now became occupied chiefly with matters pertaining to field operations and combat activities.¹

When the medical section, G-4, was organized it had not been anticipated that control of field operations of the Medical Department would devolve upon it, but no other agency was provided and such devolution was in fact a logical development for the reasons noted above.⁸ The deputy of the chief surgeon at general headquarters, and the other members of the group attached to G-4, constituted the only connecting link between the chief surgeon, A. E. F. and the medical service of armies, corps, and divisions.⁸

From the beginning of our military operations the medical section, G-4, was called upon to meet the daily emergencies of battle situations as they arose, and to cooperate in developing and applying the general policies of the entire Medical Department of the rapidly growing American Expeditionary Forces.⁸ During the more important operations two officers of the group were almost constantly at the front where they represented G-4 in the coordination of hospitalization, evacuation, and medical supply.⁸ Before corps and armies of the American Expeditionary Forces were organized they performed, in addition to their other duties, duties comparable to those of a corps or army surgeon, for at that time there was no other agency through which the higher coordinative functions of the Medical Department could be exercised during combat. For example, representatives of the medical section, G-4, supervised and directed hospitalization and evacuation of the 1st Division at Cantigny; of the divisions and corps constituting the Paris group in the Marne area; and of the 42d Division in the Champagne sector.⁸ Before a chief surgeon for the First Army was designated in July, 1918, members of G-4-B, therefore, discharged such duties as then devolved upon that office.⁸ They also effected evacuation from corps and divisions serving under control of the French or British and provided for their supply of Medical Department matériel.⁸

So far as their jurisdiction extended the chief surgeons of the First, Second, and Third Armies relieved the deputy of the chief surgeon at G-4 of the duties pertaining to hospitalization, evacuation, and medical supply which the latter previously had discharged for corps and divisions at the front.⁸

The hospitalization and evacuation plans for the St. Mihiel and Meuse-Argonne operations, in so far as procurement and evacuation were concerned, were largely prepared in G-4-B and placed into effective operation through personal consultation with the chief surgeons of the First and later the Second Armies.¹ Careful estimates of prospective battle casualties were formulated and every available resource drawn upon to care for them. Owing to limited resources, it frequently became necessary to move sanitary formations and resources from one army to another, or to the service of detached divisions.¹

The difficulties of contact, between the general staff and the Medical Department engaged in the service of the front, which had occurred during the battles in the Marne area, were greatly ameliorated when medical officers were detailed to the various sections of the general staff at general headquarters, and when a newly appointed assistant chief of staff took over the duties of G-4.⁸ This officer now uniformly acquainted members of the medical section G-4 with plans, situations, and policies so that they were able to make preliminary arrangements to the best advantage and to promote intelligently the efforts of the chief surgeons of the various armies, corps, and divisions concerned.⁸ As the group kept in close contact with those officers, and learned their facilities and needs for future requirements it was thus in a position to render them prompt assistance when required.⁸

The machinery for coordination of effort, consolidation of resources, and elasticity of control of limited resources, as reflected in the authority of the assistant chief of staff, G-4, permitted the maximum utilization of facilities.⁸ Without the interest which was manifested by the assistant chief of staff, G-4, in the activities of this subsection and his practice of notifying it of impending battles, or movements of troops, it would have been impossible for G-4-B to have met emergencies which continually arose.⁸

The geographical location of general headquarters permitted the maintenance of close contact between members of G-4-B and the surgeons of divisions, corps, and armies.⁸ It was possible for a member of this group not only to reach rapidly almost any part of the front occupied by American troops, but also through an excellent system of telephone and telegraph communication to know at all times exactly the conditions to be met.⁸ Largely because of this fact the representatives of the chief surgeon with G-4 were able to meet the daily problems which arose from the lack of authorized personnel, sanitary units and equipment with the troops; such problems they met by moving from one sector to another, on orders which G-4 initiated, casual personnel, operating teams, and sanitary units, ambulance companies, field, evacuation, and mobile hospitals.⁸ Limitations of personnel were such that without this machinery for coordination of effort and consolidation of resources, evacuation, and hospitalization of battle casualties would have been well nigh impossible.⁸ The activities of this group which pertained to supervision of medical service at the front are further discussed in Volume VIII of this history.

G-4-B was also closely in touch with the American Red Cross, especially in projects concerning hospitalization, and convalescent homes.⁸ The relations of that society to G-4-B were so intimate and so important that an attempt was made to have it transferred from the jurisdiction of G-1 (which had control of all such societies operating in the service of the American Expeditionary Forces), to that of G-4, in order to expedite transaction of business between the two offices, but this was unsuccessful.¹ The representative of the Medical Department with G-1 coordinated the activities of the American Red Cross with the policies of the Medical Department, in so far as they pertained to that department, the hospitalization enterprise of the American Red Cross being undertaken in conformity with requests of the medical group with G-4.⁸

On September 20, 1918, the chief surgeon's deputy, general headquarters, submitted the following memorandum to the acting chief of staff, G-4, concerning the organization of the medical section, G-4:⁹

The following table exhibits the personnel that I believe will be necessary to carry on the functions now devolving upon this subsection of your office. It contemplates no radical departure from the organization which has been in effect.

Brigadier general, 1; colonels, 2; lieutenant colonels, 2; majors, 2; captains or first lieutenants, 4; total commissioned, 11. Civilian clerk, 1; master hospital sergeant, 1; hospital sergeants, 2; sergeants, 1st class, 3; sergeants, 3; corporals, 2; privates, 1st class, 4; privates, 1; total enlisted, 16.

The table proposed off hand may appear to be top heavy. As a matter of fact the personnel estimated will barely be sufficient to carry on the work which is now coming to this subsection. As G-4 handles practically all the medical matters coming to general headquarters; it is believed that all technical matters affecting the Medical Department should be referred to this subsection. While General Orders 31, contemplated that we should have a representative in each section of the General Staff, it is believed that better results will accrue if we concentrate all the authorized personnel in this section excepting the officer assigned to G-5 for training purposes. Until recently we had attached to G-1 a medical officer who was assigned to the General Staff. Instead of replacing him in that section it is believed that the work carried on by him there should be performed by an officer in this subsection of G-4.

Until the organization of the First Army headquarters, this office was in fact the office of the chief surgeon of the army. At the present time it is carrying some of the duties of that army, and all of such duties in connection with certain other more or less detached combat units. The chief surgeon's office is, from the point of view of distance, remote from the front, and its contact with combat units is correspondingly slight. The necessity of providing the details of organization, instruction, mobilization of new equipment and personnel for combat units, the initiation of movement orders, etc., must all originate from this section. As a matter of fact the duties which have devolved upon and are now being performed by this subsection have been much broader in scope than it was believed by the chief surgeon was contemplated in the plan of organization at the time General Orders 31 was adopted.

Every effort has been made to decentralize, as far as possible, all details concerning the Medical Department and to devote the time of officers on duty here to constructive work, which is gradually assuming greater and more pressing proportions. Up to the present, with the number of officers now available this has practically been impossible, as the entire time of officers now connected with the subsection have been taken up with routine daily matters. It is daily becoming more evident that the chief surgeon's office, per se, has become what might properly be called a surgeon's general's office in France, and is occupied with the provision of matériel and personnel necessary to secure proper functioning of the Medical Department of the American Expeditionary Forces. There is another and most important side to the Medical Department's activities, and this is the relation of the department to combat operations. From a Medical Department viewpoint, supply is a comparatively

minor consideration. The care of the sick and wounded and the evacuation and hospitalization of these cases is always more or less an emergency measure and requires very complicated machinery to secure the desired results. The present organization, as prescribed by General Orders 31, does not provide the elasticity or necessary facilities for this most important part of the Medical Department duties. It is understood that General Orders 31 is now being rewritten with a view of correcting its organizational defects and incorporating features which have been the outgrowth of our experience under its operation.

The necessity of having a deputy of the chief surgeon at these headquarters has become generally recognized. Under our present scheme of organization it is necessary that the chief surgeon should have at these headquarters an officer who truly represents him and whose duties are more particularly those which pertain to Medical Department functions with and relations to combat troops. To produce satisfactory results requires a considerable organization. In every action of magnitude representatives from these headquarters must leave for the front for the purpose of coordinating hospitalization and evacuation until activities again assume a normal trend. It seems only logical that, inasmuch as all Medical Department activities are coordinated by G-4 of the general staff, its senior medical officer with that section of the general staff should be the chief surgeon's deputy. That is the situation which has gradually evolved since the chiefs of the services were divorced from these headquarters. As stated above, the desirability of not only continuing this organization, but recognizing the responsibilities and duties of the senior medical member of G-4 seems apparent. Because of the nature of the work and responsibilities devolving upon the chief surgeon's deputy, it is believed that the officer who occupies that position should have the rank of a general officer. On a recent visit to these headquarters the chief surgeon announced that it was his intention to recommend that his deputy here be a brigadier general. For that reason one brigadier general is shown on the above table. If the functions to be carried out by this subsection of your office are to be successfully accomplished the personnel indicated will be absolutely essential. The enlisted personnel given function largely in the same capacity as do field clerks in other subsections.

On August 14, 1918, the commander in chief, upon being advised by the chief of staff that the Medical Corps had asked for fuller representation on the general staff, stated he desired this request to be complied with.¹⁰ Accordingly, a medical officer who had been on duty with G-1 was made an acting general staff officer,¹¹ and all divisions of the general staff were advised that he should be consulted on:¹⁰

(a) All affairs of the Red Cross that have any possible connection with the Medical Department; (b) all Tables of Organization of medical units or which should show medical personnel attached; (c) changes in the type of equipment or clothing or ration, so far as they may affect health, or where, in the case of equipments, it is for the Medical Corps; (d) miscellaneous questions affecting the Medical Department.

The representative of the Medical Department with G-3 was concerned chiefly with movement of medical units; e. g., evacuation hospitals. It appeared advisable that the Medical Department should be represented on G-3 in order that its plans might be coordinated with combat operations in general.¹ This representative of the chief surgeon also served with G-5, and, in that assignment, was in charge of the training of Medical Department personnel whether they were members of units in the Joinville training area, of units or detachments with divisions, or in attendance at the Sanitary School at Langres.¹

In his final report the deputy of the chief surgeon at General Headquarters wrote concerning Medical Department representation on the general staff with especial reference to that with its fourth section as follows:¹

The present method of providing for Medical Department representation on and with the general staff is ideal, and is favored over all other previous propositions. Medical Department representation on the general staff as conceived by the acting chief of staff, G-4, more nearly approaches the ideal of organization than any other plan which has been proposed. It is hoped that the policy inaugurated by the chief of the fourth section in this respect will have demonstrated its value, and will be perpetuated in any future reorganization of the general staff. It is also hoped that the results obtained by this section of the general staff have amply demonstrated the wisdom of having adequate Medical Department representation on the general staff.

Under this organization (General Orders, No. 31) the chief surgeon's office became merely an agency for the procurement and distribution of supplies and personnel and was completely separated from the Medical Department activities connected with the Zone of Active Operations.

The classification of the Medical Department among the supply services is questionable. Its functions are so intimately connected with combat activities that it becomes a very difficult matter to administer this branch of the service if it is placed on the same basis as the purely supply departments.

In providing the necessary medical supplies for an army only one of the comparatively unimportant functions of the Medical Department has been fulfilled. The demands made upon the Medical Department by combat activities can not be satisfied if the prevailing conception of that department as a supply department is adhered to.

The organization of headquarters, general headquarters, A. E. F., as first outlined in General Orders, No. 8, 1917, followed very closely that in operation in the French Army at the time, except that for the latter army generous provision was made in the way of Medical Department representation on the fourth bureau of the general staff and none was provided for ours. As stated above, this defect was corrected some months later, after representation had again been made by the chief surgeon.

In the meantime a reorganization of the French general staff went into effect in March, 1918. This change created an additional or fifth bureau of the general staff, which was made up entirely of medical officers and was known as the Medical Department bureau. The senior officer of the section was a major general, with the title of assistant chief of staff, with the same responsibilities and privileges as his brother officers of the line of other bureaus of the general staff.

A short time before the French had published this change in staff organization, a memorandum for the commander in chief had been prepared in the office of the chief surgeon recommending this identical organization. This recommendation was never approved or disapproved, and the lack of action in the matter was a source of bitter disappointment to the chief surgeon.

In so far as general representation on the general staff is concerned, not only at headquarters, A. E. F., but also at headquarters, Services of Supply, the chief surgeon expressed his opinion on March 24, 1919, as follows:¹²

It is not believed at this time that a separate or medical section of the general staff should be created, but the medical services of the American Expeditionary Forces should be placed under G-4, general headquarters. The chief surgeon should be represented by a deputy on G-4, of high rank. In his relations with the general staff, general headquarters, he should be represented by one or more assistants on G-1, G-3, and G-5, as well as the necessary additional medical officers on G-4. It is not believed that there is any necessity for representation on G-2, general headquarters.

The chief surgeon has no executive jurisdiction over his own corps in the armies except through the executive branches of the general staff, general headquarters. He also is so dependent upon the other supply departments for operating hospitals, supplies, and evacuation as to make it impossible for him to function without the executive assistance of the general staff, Services of Supply.

Therefore, in order to make the machinery move rapidly and smoothly, it is absolutely necessary to have general staff representation in both general headquarters and Services of

Supply so as to insure the rapid and coordinate dissemination of information of daily changes at the front and to meet all demands intelligently and rapidly with the proper equipment, personnel, etc.

Under the present arrangement, in which the deputy chief surgeon is attached to G-4, general headquarters, the operation has functioned in an admirable manner, but this is recognized as being due in a large measure to the admirable cooperation given to the deputy chief surgeon on G-4 by the assistant chief of staff, G-4.

In this connection, attention is called to the fact that there was no medical representative on G-3, the G-4 group performing the functions that should have been delegated to the G-3 representatives. It is believed that representation on G-3 is necessary.

In connection with the headquarters, Services of Supply, the chief surgeon should have had an office with a deputy in charge to operate the Services of Supply activities of supply, hospitalization, statistics, finance and accounting, Services of Supply personnel, dental service, and veterinary service.

The office of the chief surgeon should be represented by assistants on G-1 and G-4 of the general staff, Services of Supply, this in view of the fact that the hospitalization division is intricately connected with and dependent upon every other supply department, and in order to maintain the proper service, should be represented on G-1 and G-4 of the general staff with such executive power as to be able to secure hospital construction or procurement by lease or rent, as well as transportation of supplies, personnel, and sick and wounded.

THE CHIEF SURGEON IN CONNECTION WITH THE ARMIES

It is well understood that orders of execution can only be given to the army through the different sections of the general staff at general headquarters, but in view of the chief surgeon's responsibility for the sanitary personnel, equipment, professional services, hygiene, etc., of the armies, he should be in close touch with the surgeons of the armies, army corps, and divisions. The chief surgeon of an army should have a medical representative on each G-1 and G-4 of the army.

The following table is submitted:

Location.

Operations—G. H. Q.

Chief surgeon.

Personnel (for army areas only).

Army equipment, medical, from advance medical supply depots.

Evacuation of sick and wounded.

Hospital trains.

Ambulance and motor transport.

Operations of same.

Supplies—S. O. S.

Deputy chief surgeon.

Hospitalization.

Supply department.

Statistics—sick and wounded.

Personnel (S. O. S.).

Hospital trains, ambulances, and motor transport.

Supply and equipment of same.

Finance and accounting.

Dental service.

Veterinary service.

Professional services.

General sanitation—inspecting, epidemiology, laboratories.

Relations with the general staff.

The chief surgeon's representation on the general staff should be as follows:

G. H. Q.:

- G-1. An assistant in connection with supply problems, railway and automatic overseas tonnage.
- G-3. An assistant to coordinate the chief surgeon's office with combat operations in general, and change of stations of army units.
- G-4. A deputy chief surgeon and necessary assistants in connection with the evacuation of sick and wounded, hospitalization, all construction and procurement of buildings, assignment of units.
- G-5. An assistant in connection with Medical Department training.

S. O. S.:

- G-4. One or more assistants in connection with hospitalization and evacuation of sick and wounded.
- G-1. One assistant in connection with all tonnage and problems.

Army headquarters:

- G-1. An assistant to the chief surgeon of the army.
- G-2. An assistant to the chief surgeon of the army.

Corps and division headquarters: No representation of general staff deemed necessary.

REFERENCES

- (1) Report from Col. S. H. Wadhams, M. C., the chief of the medical group, fourth section, general staff, general headquarters, A. E. F., to the chief of G-4, general staff, general headquarters, A. E. F., December 31, 1918. Subject: Activities of G-4 "B," 4.
- (2) General Orders, No. 31, General Headquarters, A. E. F., February 16, 1918.
- (3) Letter from the chief surgeon, A. E. F., to the commander in chief, A. E. F., February 22, 1918. Subject: Designation of medical officers to represent chief surgeon at general headquarters. On file, A. G. O., World War Division, chief surgeon's files (321.6).
- (4) Memorandum from the representative of the chief surgeon, A. E. F., with general headquarters, A. E. F., medical section, general staff, to the chief of staff, A. E. F., May 2, 1918. Subject: Duties of officers of Medical Department at general headquarters, A. E. F., G-4-B. On file, A. G. O., World War Division, chief surgeon's files (321.6).
- (5) Letter from the chief surgeon, A. E. F., to the commander in chief, A. E. F., March 15, 1918. Subject: Organization. On file, A. G. O., World War Division, chief surgeon's files (321.6).
- (6) Memorandum from acting assistant chief of staff, G-4, to the chief of staff, April 6, 1918. On file, A. G. O., World War Division, chief surgeon's files (321.6).
- (7) Letter from the chief surgeon, A. E. F., to the commander in chief, A. E. F., April 30, 1918. Subject: Need for medical section, general staff. On file, A. G. O., World War Division, chief surgeon's files (321.6).
- (8) Wadhams, S. H., Col., M. C., and Tuttle, A. D., Col., M. C.: Some of the early problems of the Medical Department, *The Military Surgeon*, Washington, D. C., 1919, xlv, No. 6, 636.
- (9) Memorandum from the medical representative of the chief surgeon, general headquarters, A. E. F., fourth section, general staff, to the acting chief of staff, G-4, September 20, 1918. Subject: Plan of organization for the medical or "B" division of G-4. On file, A. G. O., World War Division, chief surgeon's files (321.6).
- (10) Report from the commander in chief, A. E. F., to The Adjutant General of the Army (undated), part 8, Vol. I, "Activities of G-1," 29. On file, General Headquarters, A. E. F. Records.
- (11) General Orders, No. 138, General Headquarters, A. E. F., August 23, 1918.
- (12) Letter from the chief surgeon, A. E. F., to the chief of staff, A. E. F., March 24, 1919. Subject: Relation of chief surgeon's office to S. O. S., G. H. Q., and the armies. On file, A. G. O., World War Division, chief surgeon's files (321.6).

CHAPTER III

LIAISON OF THE MEDICAL DEPARTMENT, UNITED STATES ARMY, WITH THE MEDICAL SERVICES OF THE ALLIES

LIAISON WITH THE BRITISH MEDICAL SERVICE

On June 9, 1917, the chief of staff, A. E. F., notified one of our medical officers, who had been serving as military observer, of his assignment as liaison officer with the Director General, British Medical Service, in connection with the administration of American medical units serving with the British.¹ The necessity for such an assignment is indicated by the chief surgeon, A. E. F., who, on June 11, 1917, wrote the Surgeon General in part as follows, concerning his relationships with the above-mentioned units and with casual American personnel assigned to the British forces:²

* * * * * *

As already reported to your office, I assumed some weeks ago an unauthorized supervisory control over American medical personnel arriving in England, for service with British forces.

My position was such I could neither act nor advise in any authoritative manner and my relations with the personnel and the British medical officials has been purely advisory.

Many points had arisen which required decisive action or opinion, and I laid the whole matter before General Pershing with my recommendations and suggestions. These he approved and a memorandum has been issued as the result * * *.

It is General Pershing's understanding that this medical personnel with the British is not at this time under his control. If this understanding is erroneous, information is requested by cable, for I will sever my connection with this personnel, and the British medical service on my departure for France, and as chief surgeon, A. E. F., will exercise no supervision unless it is explicitly directed by the War Department. * * *

Before headquarters moved to Paris the chief surgeon wrote the liaison officer with the British as follows:³

Inclosed herewith is a copy of a memorandum prepared this date. Copies have been supplied to the following officers:

Commanding officer, United States Army, Base Hospitals Nos. 2, 4, 5, 10, 12, 21.

Director general, British medical service.

Surgeon General, United States Army, Washington, D. C.

Liaison officer, Adastral House, Victoria Embankment.

* * * * * *

Adjutant general, American Expeditionary Forces.

The Adjutant General, United States Army, Washington, D. C.

Judge advocate, American Expeditionary Forces.

Quartermaster, American Expeditionary Forces.

This memorandum covers in a general way the results of all that has been done in connection with this personnel.

In so far as the British War Office is concerned it is the result of conferences with the director general and his assistant, General Babbie, and it has the approval of the commanding general.

There has been no word of instruction of any kind received at this embassy from Washington regarding this personnel. They have been ordered to report to Lieut. Col. A. E. Bradley, M. C., for instructions and have all been reported by him to the War Office for duty.

Lacking instructions and information, no office has been organized nor established for administrative purposes. The matter was placed before General Pershing on his arrival and recommendations made which are embodied in the accompanying memorandum.

It is suggested that you look to the base hospitals for such office enlisted personnel as may be needed for the administration of the American necessities. No doubt some British assistance will be forthcoming on your proper representation of the necessity therefor.

Fifty-two medical officers, unattached to organized units, have reported up to date. Many of these have gone to France and some have been assigned here in England. Others are awaiting assignments. * * *

The Surgeon General has written me a personal letter that besides the six base hospitals already here, he proposes to send, in June, 200 medical officers and 200 nurses, and similar numbers in July and August.

The commanding officer of Base Hospital No. 2 has made inquiries as to promotion of men of his enlisted force, and steps should be taken promptly to obtain the necessary authority from the Surgeon General to promote privates, and to conduct examinations for the making of noncommissioned officers.

Personal reports have been forwarded, but some personnel returns, etc., have been held until some check could be made by an authorized central office which is established by this action of the commanding general. These held papers and some little correspondence have been left for you in the embassy office.

* * * * *

After the chief surgeon had received from The Adjutant General, United States Army, the letter quoted in Chapter II, which prescribed the scope of his authority,⁴ he wrote our liaison officer in London on June 25, as follows:⁵

Inclosed herewith is a copy of order making the assignment of "Chief surgeon, United States forces in Europe," which has been received since the preparation of memorandum and letter of instruction to you dated June 11, 1917.

It will be noted that authority in all matters in Europe pertaining to the Medical Department is vested in the chief surgeon, A. E. F., and you will be guided accordingly.

The instructions contained in the letter referred to above are therefore modified as follows:

(a) You will in future, in general, in your relations with this office and the American medical units and personnel with the British medical service, act as would a surgeon of a department in the United States.

(b) All reports, requisitions, returns, etc., of whatever nature will be forwarded to this office. The number of copies in each case will be that fixed by regulations governing under war conditions.

(c) It is directed that for all commissioned personnel and all unattached enlisted and civilian personnel, you make, in your office, nominal monthly check lists showing the address and duty of each individual. After making these lists you may transmit direct to the Surgeon General the personal reports received by you instead of forwarding them to this office, sending only to the chief surgeon the check lists above referred to.

(d) It is desired that all United States Army hospital units make reports each month, through United States medical channels, of the work being done by them—a numerical report of all cases treated by the organization in the hospital served by them.

All instructions contained in the memorandum and letter of June 11 conflicting with these instructions of this date are revoked.

The liaison officer with the British medical service, with office in Adastral House, kept the records, reports, and pay accounts, and cared for the mail of all American officers, nurses, and enlisted men of the American Expeditionary Forces on duty with the British.⁶ He was later assisted by two commissioned officers and four clerks. In discharging these duties he kept trace of the assignment of those members of our medical department who were assigned to duty

with the British, assisted them in obtaining pay and allowances, procuring leaves of absence or sick leave, and promoted their interests in other matters.⁶ For example, when any were taken prisoner, he reported that fact to the American Red Cross, which undertook to send them packages of food and to communicate with them and their families in the United States.⁶ He also reported to the chief surgeon, A. E. F., those officers under his jurisdiction who were recommended for promotion and assembled the records on which these recommendations were based. This was an important subject in which the personnel concerned so interested themselves that there was almost constant agitation in connection with it. For this reason this subject engaged a large proportion of the efforts of the liaison officer and of those of his office force.⁶ Another of his duties was to arrange when necessary for the transfer, to the direct control by the headquarters, A. E. F., of those members of the Medical Department under his supervision, who required discipline.⁶ He investigated such cases, procured witnesses, and reported them to the chief surgeon, American Expeditionary Forces.⁶

Through the liaison officer for the Medical Department in London, the medical officers serving with the base hospitals assigned to the British were in much closer contact with the chief surgeon's office than were the casual American medical officers assigned to British units. As mentioned in the chapter on "Personnel," there was great difficulty at first in reaching these casual officers, and because of their ignorance of regulations, general orders, etc., they seldom reported changes of status. In many cases officers served with the British for months before they became of record in the chief surgeon's office, A. E. F.

The liaison officer procured the records, statement of cause of disability, whether in line of duty or not, and other data required for our sick and wounded report in the case of each individual of the American Expeditionary Forces, who became incapacitated while assigned to the British, whether in France or Great Britain.⁶ A great amount of this work was carried on in cooperation with the chief surgeon of base section No. 3 (the British Isles), and after March, 1918, most of these data were returned to him;⁶ but prior to January 14, 1918, the liaison officer discharged the duties of chief surgeon of this base section, in addition to the others more properly pertaining to his office.⁷

The liaison officer cooperated in securing buildings and sites for hospitals, especially before July 1, 1918.⁶ He investigated and reported upon properties which were offered to the American Expeditionary Forces for hospitalization purposes. It is of interest to note that in the course of these activities he found it necessary to decline Windsor Castle, which was offered for our hospital purposes by the King of England; without extensive alteration, that historic structure could not be adapted to our needs.⁶ The King, therefore, offered to build a hospital in the castle grounds, and this offer was accepted.⁶ The liaison officer inspected other residences and estates offered us for hospitalization purposes, and his reports led to the acceptance of a number of these.⁶ Sites for the location of our base hospitals were thus selected throughout England, and to these American casualties were sent⁶ until in the spring of 1918, when it became necessary to send a number of them to British hospitals.⁷

Another duty of the liaison officer was the selection of those ports where American casualties from the continent would be received, the creation of machinery for their reception, and the determination of their destination when placed on British hospital trains.⁶ The ports selected included some of those in the Channel, on the Thames, in Scotland, and in Ireland.⁶

The liaison officer supervised the assignment in Great Britain of American officers of the Medical, Dental, and Sanitary Corps for the study and treatment of gassed cases, and of cardiac conditions, the study of the methods and standards used in examinations of fliers of the Royal Air Force, of food and nutrition, and of general, orthopedic and maxillofacial surgery.⁶ He investigated the treatment and care during convalescence of injuries caused by mustard gas, and the findings made in cases that came to autopsy.⁶ He was liaison officer with the Royal Air Force.⁶ The chief surgeon, A. E. F., frequently asked that certain specialists who were on duty in our hospitals which were under British control, be transferred to the service of our troops in France, and the liaison officer was charged with transactions with the British authorities which would effect the release of the specialists.⁶ The needs thus created in British hospitals he then sought to meet by assignment of untrained personnel.⁶ Our six base hospitals serving with the British were constantly in need of specialists and replacements, and these needs were handled by the liaison officer.⁶

The liaison officer not only cooperated in effecting the transfer to the American Expeditionary Forces of those American physicians who were serving in the British Army and now sought transfer to ours, but he also advised the director general of the British Army medical service, concerning the many quacks, alleged physicians, and practitioners of various pathies who went to England from the United States to enter the British Army.⁶

In addition to cooperating with the American Red Cross in its efforts to assist personnel under his jurisdiction who had been captured, the liaison officer cooperated with the representatives of that body in London.⁶ He assigned medical officers to hospitals established by that society, and was designated by the commander in chief as personal adviser and aide to the director general of the American Red Cross, when that officer conducted an inspection tour through Great Britain.⁶

One of the duties of the liaison officer was the procurement in Great Britain of supplies for our Medical Department, both before and after a purchasing agent for this department was assigned to service in Great Britain.⁶ In this duty he not only promoted procurement from civil firms but also obtained large quantities of supplies from the British Government.⁶ The liaison officer served as a member of the purchasing board for the Medical Department in Great Britain, from October, 1917, until the middle of December of that year.⁶

The British brought up for his consideration and action many questions which pertained to the British Expeditionary Force in France, and to the American Expeditionary Forces as entities.⁶ The liaison officer was the channel of communication between the chief surgeon, A. E. F., and the chief surgeon, base section No. 3, on the one hand, and the Royal Army Medical Corps on the other.⁶ The chief surgeon's office, A. E. F., also transacted business with the British through the British mission established at Tours, and through the liaison

officer pertaining to G-1, who represented the American Expeditionary Forces at headquarters of the British Expeditionary Forces.⁶

Deaths occurring among American units or detached personnel serving with the British were reported direct to the headquarters, American Expeditionary Forces.⁸

After the base section No. 3 was organized and a chief surgeon was assigned to it, the liaison officer continued to be charged with supervision of the six base hospitals and casual American medical personnel assigned to the British, but his activities did not extend to the medical organizations of our Second Corps.⁶ That command which consisted of American troops serving under British control was provided with a corps surgeon who was directly responsible to the chief surgeon, A. E. F., or in some matters to the latter's deputy at general headquarters.⁶

The average personnel of the Medical Department, A. E. F., constantly on duty with the British Army approximated 800 officers, 600 nurses, and 1,100 enlisted men.⁶ On November 23, 1918, there were serving with the British, 888 officers, 1,311 enlisted men, 676 nurses, and 24 civilian employees.⁶

American Medical Department organizations which participated in the North Russian expedition were under British command, but occupied, in reference to the liaison officer with the British, a position comparable to that of the base hospitals assigned to the British Expeditionary Force in France.⁶ The official methods of the Medical Department organizations of the North Russia expedition were made to conform, therefore, to British requirements in so far as they were relevant to British control, but other reports and returns conformed to American requirements.⁶

LIAISON WITH THE FRENCH MEDICAL SERVICE

The increasing number of American troops which entered the lines, mingled with the French, brought the two armies into very close relationship, until March, 1918, when under military exigencies the two services operated as one.⁹ The chief surgeon's office had to have a clear knowledge of the organization of the French Army and especially that of its medical department, from the Ministry of War to the field sanitary units, for French methods required that business be transacted only through definitely authorized agents.⁹ Therefore, it was necessary that the Medical Department, A. E. F., maintain the closest contact possible with the French authorities, for their cooperation was essential in a number of matters including the development of our program for hospital procurement.⁹

The French realized more clearly than had the Americans, this necessity for close cooperation and provided liaison officers for every branch of endeavor.⁹ Very shortly after the arrival of the first American troops the French Government established at the Ministry of War the special Franco-American bureau with subbureaus, known as sections, wherever needed.⁹ It thus provided an agency through which all matters affecting the two services could be studied and handled. In the subsecretariat of state, French medical service, a subsection of this Franco-American service was established.⁹ Also, in this subsecretariat a special technical division charged with American hospitalization

was organized. The object of this latter division was to assist in every way possible the procurement of hospitals, hospital sites, and medical supplies for the American Expeditionary Forces, and to facilitate the transfer to our medical service of those existing French hospital installations and buildings which our service needed.⁹

Owing to the shortage of medical officers, the chief surgeon, A. E. F., was unable to comply with the request of the French that he place one of his subordinates as liaison officer in this Franco-American section but he did direct the chief of the hospitalization division in his office to effect close liaison service therewith, in addition to his other duties.⁹ At this time when the great problems of the Medical Department were those pertaining to the hospitalization and supply and were concerned almost exclusively with the Services of Supply, this plan worked very satisfactorily.⁹

On August 25, 1917, in anticipation of the movement of General Headquarters of the American Expeditionary Forces to Chaumont, the chief surgeon designated the purchasing officer for the Medical Department, in Paris, as liaison officer for the French medical service,¹⁰ and on the same date requested that a French officer be attached for liaison purposes to his own office after this had been established at Chaumont.¹¹

Therefore, after the chief surgeon's office arrived at Chaumont an experienced French medical officer was assigned to liaison service with it, but after this officer had reported the French commander in chief required that he be placed under his jurisdiction.¹² This the undersecretary refused to permit; and as the French commander in chief would allow no French officer to remain in the zone of the armies who was not entirely under his control, this liaison officer was relieved.¹² The result was that the chief surgeon, A. E. F., lost a valuable adviser, and the close and direct relations between his office and the subsecretary of state, medical department, in Paris, were severed.¹²

On September 15, 1917, the chief surgeon and the chief of the hospitalization division of his office visited the French headquarters at Compeigne, for the purpose of making arrangements concerning the transaction of business relating to our Medical Department in the zone of the armies, and on the 17th they held a conference in Paris to determine the manner in which the Medical Department should transact business with the secretariat, now that our headquarters had moved into the zone of the armies.¹²

After headquarters, A. E. F., were established at Chaumont, the French high command established there a military mission which was organized with the same bureaus as the French General Staff.⁹ This organization provided a medical section under a French medical officer, who was charged with transaction of all business of whatever nature affecting the Medical Department in the zone of the armies.⁹ The chief of the hospitalization division in the chief surgeon's office was designated liaison officer between that office and the French mission.⁹

As questions pertaining to procurement of hospitals and other facilities were of immediate concern to the Services of Supply, in whose jurisdiction base hospitals and supply depots were being located in great numbers, it was expedient that the chief surgeon of that command also be in close touch with the

French subsecretary of state, medical service.¹³ The chief surgeon, A. E. F., therefore, notified the chief of the French mission at Chaumont, on October 19, 1917, that he had designated the chief surgeon, Services of Supply, as his representative for all matters of Medical Department interest outside the zone of the armies.¹³ He also asked that a French liaison officer be attached to the latter's office, which was then in Paris.¹⁴ This was done, and after headquarters of the Services of Supply moved to Tours in January, 1918, a French liaison officer was attached to the office of its chief surgeon there.¹⁵

On February 9, 1918,¹⁶ in compliance with a request of the subsecretary of state, medical service,¹⁷ a senior medical officer of the American Expeditionary Forces was assigned to liaison duties with his office, and other officers to each of the 11 regions in which Americans were then conducting their most important activities.¹⁶

The officer selected for this assignment as liaison officer with the subsecretary of state, medical service, was the chief of the hospitalization division of the chief surgeon's office, who was performing liaison duty with the French mission at general headquarters.⁹ The cumulation of such duties upon one individual was necessitated by the shortage of officers and, in fact, worked out well, for the great majority of questions which required negotiations with the French continued to pertain to procurement of hospitals and medical supplies.⁹

After the chief surgeon's office, A. E. F., moved to Tours, in March, 1918,¹⁸ it transacted some business direct with the French mission established in that city,¹⁹ but contact was maintained chiefly through the officer referred to above, who remained with general headquarters at Chaumont as representative of the chief surgeon.²⁰ Relieved from duty in the hospitalization division, he now in addition to his other duties, maintained liaison between the Medical Department, A. E. F., on the one hand, and, on the other, with the subsecretary of state, medical service, in Paris, and the French mission at Chaumont.⁹ Part of this duty was his supervision of the liaison effected by other medical officers assigned to that duty, whether for armies, corps, or divisions in the field, or for regional subsections in the Services of Supply.⁹

In compliance with a circular letter from the Minister of War, dated December 30, 1917, Franco-American sections had been instituted in connection with the large French services.²¹ These sections were charged with the study of all Franco-American affairs transmitted to them and the solution of problems incident thereto.²¹

Eventually, sections of the Franco-American service were established at each headquarters of the military regions (approximately 20) into which France was divided, and a local medical officer of the A. E. F. was assigned to each, in addition to his other duties, as liaison officer for the chief surgeon.⁹ All matters of policy were determined between the Franco-American section in Paris, and the chief surgeon's office, but, when policies had been declared the execution of details conforming thereto was made a duty of the regional subsections.⁹ The activities of these regional officers are discussed at greater length below.

The matters which the liaison officer for the Medical Department conducted with the office of the subsecretary of state, medical service, may be classified as follows:²² (a) Procurement of French hospitals for the American Expeditionary

Forces; (b) procurement of existing buildings, such as hotels and schoolhouses, for hospital purposes; (c) all questions of standard medical supplies obtained from the French medical service; (d) the execution of contracts for the purchase of sanitary formations from the French medical service, such as mobile hospitals and mobile surgical units, etc.; (e) formulation of policies regarding the exchange of the necessary data covering American patients in French hospitals and French patients in American hospitals; (f) formulation of policies regarding control of communicable diseases, particularly with a view of protecting the French civil population; (g) miscellaneous matters.

The above classification practically outlines the scope of duties which devolved upon the American liaison officer with the French medical service.²² The matters which required the greatest amount of work were those connected with procurement of hospitals of the American Expeditionary Forces, and the hospital supplies which could be secured better in Europe than in the United States.²² From the very beginning of our effort it was necessary that the American Expeditionary Forces take over from the French certain hospitals and their equipment, in order to meet the needs of arriving American troops, and this need continued until our barrack hospitals could be constructed.²² At first the procedure for taking over these hospitals was by direct request upon the office of the subsecretary of state, through the liaison officer attached to his office.²² Later this duty was performed through the regional liaison officers for the Medical Department.⁹ Each of these officers acted on all routine matters as an intermediary between the local American authorities and the director of the French medical service for the region concerned.⁹ Matters of policy continued to be determined between the representative of the chief surgeon, A. E. F., and the office of the subsecretary of state, medical service, in the Ministry of War, but the details conforming thereto were carried out by the regional liaison officers.⁹

As noted above, Franco-American sections were established as need arose at headquarters of each of the 20 military administrative regions into which France was divided.⁹ A medical officer of the American Expeditionary Forces in each of these regions was accredited to the respective Franco-American section established at headquarters of each, and, in his liaison duties, which he discharged in addition to others, was under the control of the liaison officer for the Medical Department.⁹

These officers were given definite rules concerning acquisition of hospital sites and of buildings suitable for hospital purposes, the taking over of existing French hospitals, and the coordination of the medical services of the two countries in many other respects, but the greater part of their duties was concerned with hospitalization.²³ They were directed to maintain contact and cordial relations with the regional medical director of the French Army, with whom they conducted initial negotiations for the transfer of projects and installations; to exert every effort to avoid friction; and to arrange with the medical director the local policies which would guide them in future liaison activities.²³ In their instructions these officers were informed that the French had manifested a desire to cooperate in every way possible and already had given us many of their best hospitals.²³ They familiarized themselves with all hospitalization

prospects in their regions in order that in emergencies appropriate request could be made for their procurement.²³ From time to time they were directed to inspect and report upon hospital properties made available by the French, to conduct such investigations, as were prescribed, of certain projects or installations, and were given instructions concerning further development of the liaison service.²³ Also, they were guided by general orders concerning liaison.²³ They not only notified the chief surgeon, A. E. F., of their liaison activities but also the chief surgeon, Services of Supply, until the office of the former absorbed that of the latter in March, 1918, promptly furnishing the latter any hospitalization data he desired and assisting him in the acquisition of buildings.²³ The liaison officer for the district of Paris was concerned with the proper distribution of American patients in that jurisdiction, for certain hospitals had been designated for the reception of American wounded, and close cooperation with the French was necessary in order that this distribution might be made to best advantage.²⁴

Liaison in matters pertaining to sanitation and epidemiology of both civil communities and military organizations was maintained, through the medical officers of the French military mission at general headquarters, A. E. F., and at headquarters, Services of Supply, and through the Franco-American sections in each of the regions wherever American troops were stationed or through which they passed.²⁵ The French mission at headquarters, Services of Supply, included a medical officer in direct liaison with the chief surgeon, A. E. F., and suitable French liaison officers were assigned to duty with the chief surgeons of sections of the Services of Supply, and with the commanding officers of a few of the larger hospital centers.²⁶ The chief of the French skin and venereal service of each region was directly accredited to the American medical service as liaison officer in all matters affecting his specialty.²⁶ The technical chiefs at the French headquarters of the several regions, were directed to cooperate with the local liaison officers of the American Expeditionary Forces in matters affecting the hygiene, epidemiology, and prophylaxis of American troops.²⁶ They were ordered to effect technical cooperation in the following matters especially: ²⁶ (1) Study and survey of water supplies; (2) employment of all bacteriological laboratories by American medical officers in their efforts to confirm the diagnosis of communicable diseases, detect carriers, perform water analyses, etc.; (3) regular and constant receipt of information concerning incidence of infectious diseases among American troops and measures taken to control their spread; reciprocal notification to the American authorities of all epidemics of any importance among French civil or military populations with note of preventive measures taken; ²⁶ (4) notification to the Medical Department of the American Expeditionary Forces of localities quarantined and released from quarantine. Study in collaboration with the chief medical officers of hospital centers and of dermatovenereological subcenters, of all questions concerning the treatment and prevention of venereal disease and information of the Medical Department of all regulations, circular letters, and notices concerning sanitation, epidemiology, and preventive measures.²⁶

In order to comply with these instructions the following reports were made by the regional Franco-American sections:²⁶ Report every 10 days of all con-

tagious diseases among American troops stationed in the region, including all necessary precautions. Prompt notice to civil authorities of contagious diseases occurring among American troops.²⁶ Monthly report by chiefs of dermatovenereological centers and subcenters, including in a special chapter all questions concerning venereal diseases occurring among American troops.²⁶ Monthly report by the assistant chief medical officer of the region or the technical adviser. This was addressed to the medical officer of the French military mission at headquarters, Services of Supply, to be transmitted to the office of the chief surgeon, A. E. F.²⁶

The Franco-American liaison was of considerable benefit and importance in certain other technical professional matters; e. g., delivery of sera to American medical officers by French laboratories, sterilization, and analysis of drinking water in railroad stations.²⁶

A French ministerial circular letter of October 18, 1919, provided for collaboration of the American and French medical authorities in reports relative to the bacteriological and chemical tests of water supplies along the railroad lines traversed by troop convoys.²⁶

Just as liaison was established between the American and French Medical Departments at American headquarters at Chaumont, at Tours, and at headquarters of the several French military regions, it was similarly maintained in the field between the medical service of smaller organizations of American troops and that of the medical service of the command with which they were serving. Medical officers of American corps or divisions operating under the control of one of the allied nations were designated, in addition to their other duties, as liaison officers for the chief surgeon, A. E. F., between the medical services of the troops concerned.²² Thus, on May 21, 1918, an American medical officer was assigned as liaison officer for the medical service of the 1st Division with whatever French force to which that division would be assigned,²⁷ and the chief surgeon, American First Corps, on July 13, was made liaison officer for the American Medical Department with the French Sixth Army under whose tactical control that corps was then serving.²⁸ Similarly, when French divisions later served under American command, French medical officers of those commands maintained liaison with the chief surgeons of the American corps and armies to which such divisions were assigned.⁹ This liaison effected by our medical service with that of our allies in the field, the chief surgeon supervised through his deputy at general headquarters.²²

VETERINARY LIAISON WITH THE FRENCH

On April 11, 1918, the chief surgeon, A. E. F., was directed to designate two veterinary officers who would form, with two French veterinary officers, a Franco-American veterinary mission which would be charged with investigating and recommending measures to prevent or combat epidemics among animals in France.²⁹ A French veterinary inspector designated by the under-secretary of state was charged by the latter with keeping this mission informed of all epidemics that might occur in the vicinity of American troops.³⁰ The mission was to visit the organizations in which contagious diseases were reported and suggest all prophylactic measures indicated by insanitary conditions.³⁰

The mission also was at the disposal of the veterinary inspector who was to seek its advice and assign it to services in connection with any matters pertaining to the French veterinary general inspectorate.³⁰ The undersecretary suggested that the following duties of the French mission would be especially useful:³⁰ (1) Visiting American remount depots, both to ascertain the condition of animals bought and the state of those places from a sanitary standpoint. (2) Enforcing glanders prophylaxis by systematic use of malleinization, as carried on in the French Army. (3) Furnishing the United States Army with every information as to how to deal with diseases due to acclimatization of young horses, notably strangles and its complications. (4) Carrying on antimange defense on a methodical basis through the use of chemical products (sulphur and baths) and promptly initiating the construction of all installations needed. (5) Providing for defense against the various sorts of lymphangitis, in order to prevent spread of same, both in the United States and the French Army. (6) Suggesting all measures to be taken in connection with any other contagious disease that might be reported in the United States Army. (7) In regard to the animal's food, the composition of rations, the use of substitute foodstuffs, the making of summer and winter horseshoes, and giving advice with a view to facilitating the proper maintenance of horse strength.

It was understood the mission should report every week on the work it had done to the high American and French veterinary authorities to which it was attached and should point out in special reports the improvements that could be made in the organization and functioning of the veterinary service in each army.³⁰

It was later proposed by the French that the instructions for the mission be made more definite, that it be made mandatory that this mission be consulted in case of epidemics, and that when ordered to do so, or when it thought such action necessary, it visit the organizations where contagious diseases were reported and propose appropriate prophylactic measures.³¹

On September 30, 1918, the chief surgeon, A. E. F., notified the chief of the Franco-American veterinary mission that the value of the mission, operating on the above lines, had ceased, but that it could be of great value if its activities were directed into other channels.³² He therefore requested that a French veterinary officer be assigned as liaison officer in the chief surgeon's office, A. E. F., and that one be assigned as liaison officer with the assistant chief veterinarian of the advance, intermediate and each base section, respectively, and to each army.³² The services of these officers were to be purely liaison between the assistant chief veterinarian concerned and the local French veterinary and civil authorities.³² In conformity with this recommendation one French veterinary officer was attached for liaison purposes to the chief of the veterinary service, A. E. F., at Tours and another to the assistant chief of the veterinary service in the advance section, at Nogent en Bassigny.³³ Others were also assigned to the First, Second, and Third Armies,³⁴ but the Franco-American veterinary liaison mission with headquarters in Paris continued to operate until several months after the beginning of the armistice.³⁵

The last French liaison officer on duty with the Medical Department, A. E. F., was relieved on June 30, 1919.³⁶

LIAISON WITH THE ITALIAN MEDICAL SERVICE

Liaison with the Italian medical service was maintained through our chief surgeon base section, No. 8.³⁷ On November 23, 1918, 57 officers and 1,010 enlisted men of the American Expeditionary Forces were serving under the control of the Italian Army.³⁷

PERSONNEL

(July 28, 1917, to July 15, 1919)

LIAISON OFFICERS

WITH THE BRITISH ARMY

Col. Matthew A. De Laney, M. C.

Col. William J. L. Lyster, M. C.

WITH THE FRENCH ARMY

Col. Sanford A. Wadhams, M. C.

WITH THE ITALIAN ARMY

Col. Elbert E. Persons, M. C.

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- (3) Letter from the chief surgeon, A. E. F., to Maj. W. J. L. Lyster, M. C., June 11, 1917. Subject: Administration of American medical personnel serving with British service. On file, Record Room, S. G. O. (9795).
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- (31) Letter from the chief of the directorate of the rear to the chief of G-4, general headquarters, September (no date), 1918. Subject: Franco-American veterinary mission. On file, A. G. O., World War Division, chief surgeon's files (211.01).
- (32) Letter from the chief surgeon, A. E. F., to chief of Franco-American veterinary liaison mission, Paris, September 30, 1918. Subject: Franco-American liaison mission. On file, A. G. O., World War Division, chief surgeon's files (211.01).
- (33) Letter from chief of French mission at headquarters, S. O. S., to the commanding general, S. O. S., October 8, 1918. Subject: French veterinarians appointed to the A. E. F. On file, A. G. O., World War Division, chief surgeon's files (211.01).
- (34) Letter from the chief surgeon, A. E. F., to the Franco-American veterinary liaison mission, Paris, January 24, 1919. Subject: Assignment of French veterinarians to Second American Army; and letter from the chief veterinarian, A. E. F., March 15, 1919. Subject: Liaison officers, first and third Armies. On file, A. G. O., World War Division, chief surgeon's files (211.01).
- (35) Letter from the chief of the Franco-American veterinary liaison mission to the chief surgeon, A. E. F., January 14, 1919. Subject: American liaison officer. On file, A. G. O., World War Division, chief surgeon's files (211.01).
- (36) Memorandum from the chief surgeon, A. E. F., to the assistant chief of staff, G-1, S. O. S., July 1, 1919. Subject: French liaison officer relieved from duty. On file, A. G. O., World War Division, chief surgeon's files (211.01).
- (37) Report of the activities of the Ambulance Service with the Italian Army (not dated), by Col. E. E. Persons, M. C. On file, Historical Division, S. G. O.

CHAPTER IV

THE ADMINISTRATION DIVISION ^a

When the chief surgeon's office, A. E. F., was organized on July 28, 1917, one of its divisions was that of records and correspondence. This division was charged not only with central control of all communications entering and leaving the office but also with certain elements of internal administration of the office. The last mentioned duty later determined the name of this division.

The methods adopted for the care, control, and disposition of records, and for office administration, were not the result of preliminary plans, for to a large degree they were adaptations to necessities. It was soon determined that a definite system of recording correspondence capable of expansion had to be established, therefore, the War Department filing system was instituted with such modifications as appeared necessary for its adaptation to the needs of the Medical Department in time of war. This system adopted at this time was never changed in principle. The procurement of equipment and supplies for the current work and expansion of the chief surgeon's office became one of the duties of this division, thus taking over services which had been performed by several officers prior to its organization. One of the earliest duties of the office staff had been to obtain office supplies and equipment. The three small rooms at No. 17 Rue Constantine in which the office of the chief surgeon first was located in June, 1917, were furnished by the French Government with a few tables, desks, and chairs, which with several typewriters brought from the United States, constituted the initial equipment of the chief surgeons' office. The procurement of the additional furniture and equipment required when the chief surgeon's office moved, in July, into the six rooms allotted it in the Hotel St. Anne, was, in part, one of the earliest activities of the administration division.

An exceptionally aggravating difficulty, which existed at first arose from the fact that at that time no American post office service was provided, and mail intended for personnel of the Medical Department was addressed in the care of the chief surgeon. All of this mail found its way to the administration division, where its importance and value were fully appreciated, but where there was not force adequate to handle it. When the first officials of the American post office arrived, some 10,000 letters had accumulated.

Another duty of the administration division was the improvisation of such blank forms as were necessary, and provisions for the printing of these and other documents. Often the division was embarrassed by the demands for paper, and many expedients were utilized to conserve the supply. Old envelopes were used for scratch paper, letterheads were cut in half for short letters and memoranda. Small pieces were used whenever possible and both sides of each sheet were used in mimeographing, multigraphing, printing, etc., but despite all the efforts at economy the shortage in paper was always serious.

^a Entire chapter based on "Report on the administrative section of the chief surgeon's office, A. E. F., undated," by Capt. R. A. Dickson, M. A. C. On file, Historical Division, S. G. O.

Very early in the history of the American Expeditionary Forces the need for clerical help in the chief surgeon's office became very urgent. Soldier clerks were drawn from the six base hospitals then serving with the British and a few others were enlisted from among American citizens resident in France. Difficulty in obtaining suitable clerical help continued after the chief surgeon's office moved with headquarters to Chaumont, early in September of 1917. However, while the chief surgeon's office was located at Chaumont the need for clerks was gradually relieved, for during this time base hospitals began to arrive in France; and as they could not promptly be located, their personnel was available for transfer. Accordingly some of the stenographers and typists from these units were assigned to the chief surgeon's office.

As the work continued to expand other personnel, commissioned, enlisted, and civilian, were assigned to this office until their number eventually approximated 500 persons. The officer in charge of the administration division supervised the two officers who were in command of the two detachments into which were grouped enlisted personnel assigned to the chief surgeon's office. One of these officers also was in general charge of the civilian employees on duty in the office.

In his procurement and care of office furniture and equipment the officer at the head of this division was assisted by a property officer who was immediately accountable for all Government property in the chief surgeon's office. Other officers under his jurisdiction were those engaged in the service of the record room and library, and the officers who served by roster throughout the night in the chief surgeon's office. Another of the duties discharged by the chief of this division was the procurement of additional office space. Work was increasing in a geometrical ratio and until after the armistice was signed progressively greater expansions in accommodations were necessary.

It had been anticipated that the nine rooms assigned to the chief surgeon's office in one of the French barracks at Chaumont would be ample for prospective needs, but they were soon outgrown and the problem of additional accommodations became very serious. This was solved as an incident to the transfer of the chief surgeon's office to Tours, on March 21, 1918.

The extent to which personnel, records, office equipment, and supplies had increased at Chaumont was evidenced by the fact that when the chief surgeon's office moved to Tours an entire train was necessary for their transportation, in contrast to one car which had been ample for the movement of the chief surgeon's office from Paris to Chaumont.

At Tours the chief surgeon's office occupied rooms in building No. 3 of the French Barracks No. 66, but by September 1, 1918, it had so expanded that the finance and accounts and the statistical divisions were moved to other buildings.

No record was kept in detail of the vast amount of correspondence, reports, and returns which passed through the chief surgeon's office. It was decided that the time necessary to count and tabulate the number of pieces of mail could be used more advantageously otherwise. All these documents passed through the record office. Incoming mail was opened in one office, taken to the desk of the officer in charge of records and correspondence, and thence

distributed by him and his assistants to the different divisions of the chief surgeon's office. Similarly, mail from the different divisions of the office, after being signed by the respective chief, was concentrated here, examined, and sent to the mailing room. By this means all the information passing in or out of the office was so concentrated that the officer in charge of this division was able to answer many inquiries coming over the phone or otherwise, without reference to other divisions. This method also enabled him to follow up many papers that might otherwise have been misplaced.

All telegrams were numbered beginning with No. 1 on the 1st of each month so that any reply could refer to the number on this telegram and the sender could be located without delay.

PERSONNEL ^a

(July 28, 1917, to July 15, 1919)

Lieut. Col. Robert A. Dickson, San. Corps, chief.

Maj. Arthur Morehouse, San. Corps.

Maj. Arthur W. Proctor, San. Corps.

Capt. William J. Fenton, San. Corps.

Capt. Henry W. Kelly, San. Corps.

Capt. Frederick W. Mueller, jr., San. Corps.

Capt. Frank Steiner, San. Corps.

First Lieut. Orin F. Hallam, San. Corps.

First Lieut. Harry C. Hanford, San. Corps.

^a In this list have been included the names of those who at one time or another were assigned to the division during the period, July 28, 1917, to July 15, 1919.

There are two primary groups—the heads of the division or the section and the assistants. In each group names have been arranged alphabetically, by grades, irrespective of chronological sequence of service.

CHAPTER V

THE PERSONNEL DIVISION

ACTIVITIES

After the office of the chief surgeon was organized on July 28, 1917, its personnel division was charged with all matters having to do with personnel of the several branches of the Medical Department, A. E. F.¹ As in the Surgeon General's office,^a this included all administrative control of their promotion and assignment to station, and, in some instances, appointment.¹ A dental section of the personnel division was organized toward the end of August, 1917, under the officer who was also dental surgeon for headquarters.² The chief of the Army Nurse Corps did not become a part of the personnel division in the office of the chief surgeon, A. E. F., until that office moved to Tours in March, 1918, when it absorbed the office of the chief surgeon, Services of Supply, in which the chief of the Army Nurse Corps, A. E. F., theretofore had been serving.³ The chief nurse then became the head of the Army Nurse Corps section in the personnel division of the chief surgeon's office, A. E. F.³ Before August 29, 1918, officers and men pertaining to the veterinary service were assigned to the remount service in the Quartermaster Department, and until that date this personnel operated under that department.⁴ Subsequent thereto the members of the veterinary service were under the control of the veterinary division which was then established in the chief surgeon's office.⁴ After the chief surgeon's office was fully organized the personnel belonging to the dental, veterinary, and nursing services were, generally speaking, under the administrative control of the chiefs of such services, and the head of the personnel division exercised only an indirect supervision over their subordinates, but requests for changes of assignment and other technical matters came to his office as a phase of routine and in conformity with his general control.⁵

Though the personnel division of the chief surgeon's office eventually exercised general administrative control, as outlined above, over all members of the Medical Department in the American Expeditionary Forces, in certain fields such responsibility was, in some degree at least, in subordinate offices.⁴ Thus before March 21, 1918, the personnel serving in the Services of Supply was under the administrative control of the chief surgeon of that jurisdiction, until his office was absorbed by that of the chief surgeon, A. E. F.⁴ After the chief surgeon's office, A. E. F., had moved to Tours its personnel division maintained contact with the medical service in the zone of the armies through the chief surgeon's representative at general headquarters.⁴ In the several armies Medical Department assignments were controlled by the respective army surgeons. Authority was granted eventually to the director of professional services to procure travel orders for consultants direct from the general headquarters,⁶ and the director of the division of laboratories and infectious diseases

* Consult Chap. III, Vol. I, of this history.

was authorized to request travel orders for his subordinates without reference to the chief surgeon's office.⁷ With members of the Medical Department, who were serving with one or another of our allies, the personnel division maintained contact through the respective liaison officers accredited to the medical services of those countries.⁸ Members of the sections of the United States Army Ambulance Service, which were loaned to the French and Italian Governments, had a relationship with the chief surgeon's office in a few matters, especially those pertaining to technical reports; but when some of these sections were reloaned by those Governments to the United States, their members came more directly under the control of the personnel division as elements of the Medical Department, A. E. F., except in a very few matters; e. g., fragmentation of units.⁹ Authority for assignment of personnel within their jurisdiction, and for promotion of enlisted men to certain grades, was granted the chief surgeons of armies, corps, and divisions, to surgeons of territorial areas, and the commanding officers of such Medical Department formations as hospital centers.¹⁰

A part of the Medical Department of the United States Navy, serving in the American Expeditionary Forces, was under the control of the chief surgeon, A. E. F., in conformity with the regulation which prescribed that when marines were serving with the Army they would come under the jurisdiction of the latter.¹¹ Not only the medical officers and enlisted men on duty with the marines, but also the personnel of Naval Base Hospital No. 1, assigned to their service, therefore, came under the chief surgeon, A. E. F.¹¹ This personnel of the Medical Department of the Navy increased from 5 officers and 34 enlisted men in June, 1917, to 68 officers and 493 enlisted men in September, 1918, after which month its strength gradually fell.¹² The highest number of its officers on this duty was reached in January, 1919, when these totaled 72.¹³ This naval personnel included that on duty at Naval Base Hospital No. 1,¹⁴ located at Brest, that serving with the marine bridge which formed a part of the 2d Division,¹⁵ and four surgical teams.¹⁶ Naval Base Hospital No. 5, Brest, offered 200 beds to the Army but this was a purely naval institution in all other respects.¹¹

After the office of the chief surgeon, A. E. F., moved on March 21, 1918, to Tours, orders affecting Medical Department personnel under the jurisdiction of that command, were issued by headquarters, Services of Supply.⁴ Orders affecting personnel in the zone of the armies, or on duty with the United States Army Ambulance Service, were issued by general headquarters on request of the personnel division of the chief surgeon's office or occasionally by telephone on request of that division through the representative of the chief surgeon with the general staff.⁵ More frequently in emergencies orders from this source were obtained by telegraphic request upon the adjutant general, A. E. F., at Chaumont.⁵

Headquarters of the special services—i. e., the professional services of the Medical Department—were established in September, 1917, at Neufchateau.⁴ Here the professional services were directly under control of the chief surgeon's office, until the reorganization of the American Expeditionary Forces in March, 1918, after which date the group was under concurrent jurisdiction of the hospitalization division of that office at Tours and of the representative of the

chief surgeon with the general staff, A. E. F., at Chaumont.⁴ The consultants supervised the professional work of the officers serving in their respective specialties, and acted as agents of the personnel division, in so far as they recommended assignments of the officers who were under their professional supervision. Such recommendations were approved in practically all instances, except that in some cases officers were held in certain positions for disciplinary reasons.⁴

Orders issued on the recommendations of the senior consultants were at first issued through the personnel division of the chief surgeon's office, but later, because of the large increase in work involved, and in order to expedite service, they were issued through the director of professional services stationed at Chaumont who was authorized to procure them direct from general headquarters, A. E. F.⁴ This led to complications at times because of the possibility of general headquarters and headquarters, Services of Supply, issuing conflicting orders concerning the same officer, but this system was otherwise so generally advantageous that it was continued.⁴

Until the two offices were consolidated the personnel division in the office of the chief surgeon, A. E. F., and in that of the chief surgeon, line of communications, maintained very close contact.⁵ The personnel division of the chief surgeon's office, line of communications, exercised control over all medical personnel within its jurisdiction until January, 1918, when this authority was decentralized, the surgeons of the several territorial sections of the American Expeditionary Forces then assuming supervision of all medical personnel within their respective borders, except that serving at base hospitals.⁵

Replacements were handled entirely through the Services of Supply.⁴ A medical casual depot at Blois was planned and practically organized when it was taken over as a casual officers' depot.⁴ It continued, however, to receive and distribute Medical Department casualties until July, 1918, when this service was transferred to the 1st Depot Division at St. Aignan.⁴ This transfer was made with a view of establishing a short course of training in field work at the 1st Depot Division, but it was never possible to carry out this plan because of the constant shortage of Medical Department enlisted personnel which necessitated the prompt use of all available men, the longest stay in the depot being not more than two weeks.⁴ The transfer was a disadvantage, since it occasioned some delay in getting officers and men to points where they were needed at once. This delay was due chiefly to lack of transportation.⁴

One of the greatest difficulties encountered by the personnel division of the chief surgeon's office was that of keeping record of the stations of officers, nurses, and men.⁴ This difficulty was due to delays or losses of documents in the mail, carelessness in rendering reports, and similar causes.⁴ Perhaps the greatest factor occasioning this difficulty was the fact that under general orders, A. E. F., daily change reports were rendered direct to the central records office, and many officers thought that these records were forwarded to the chief surgeon.⁴ It was not until after the armistice had been signed, when service became somewhat more settled, that it was possible to correct and complete records, and even at the best there was always uncertainty concerning the actual location of many officers, nurses, and enlisted men.⁴ During the

summer of 1918 orders were issued that all personnel records were to be kept by the central records office and that no staff department should retain any of them.⁴ This order was the result of the belief that centralization of records was the only efficient method, and it undoubtedly would have prevented duplication of them; but it was thought at that time by the chief surgeon's office that such action would have utterly disrupted the medical service.⁴ In point of fact the order was never carried into effect, and records of Medical Department personnel were retained in the personnel division of the chief surgeon's office until the end of the war.⁴

It was much more difficult to obtain accurate records of the casual officers assigned to the British Expeditionary Force in France who arrived in the period June to September, 1917, than the records of those on duty with Base Hospitals Nos. 2, 4, 5, 10, 12, and 21 which had been attached to the British in May and June of that year.⁴ Officers connected with these hospitals were in much closer contact with the American Army than those casual officers assigned to purely British units.⁴ There was great difficulty at first in reaching these latter officers, and because of their ignorance of regulations, general orders, etc., they very seldom reported change of status.⁴ In many cases officers served with the British for months before the chief surgeon's office had record of them, and in general it was difficult to obtain from them personal reports.⁴

It was also very difficult to obtain recommendations for promotions for officers serving with the British, and many of those concerned came to feel that the Medical Department was not sufficiently interested in the matter.⁴ It would have been advantageous had there been a Medical Department representative attached to the British headquarters in France for the purpose of keeping in touch with these casual medical officers and of informing them of the various orders which might affect their status.⁴ The chief surgeon of the American Second Corps was in liaison with headquarters, British Expeditionary Force in France, but only in so far as corps interests were concerned.⁴

STRENGTH OF MEDICAL DEPARTMENT PERSONNEL

Personnel of the Medical Department increased from 7 officers and about twice that number of clerks (including 2 enlisted men) in June, 1917,¹⁷ to a maximum of 174,083 on January 11, 1918,¹⁸ but this great expansion was effected only after repeated urgent requisitions.¹⁸ A most important function of the personnel division was to provide personnel to keep activities of the Medical Department up to standard despite a constantly increasing shortage of Medical Department personnel,⁴ especially of officers and nurses.^{19 a}

The acute needs of the Medical Department for personnel were considerably relieved by the cessation of hostilities, and by the splitting up of two depot and four combat divisions.²⁰ On November 16, 1918, a memorandum was submitted to the effect that no more Medical Department units from the United States were desired, but that there was need for the following personnel of that department as casuals: 200 medical officers; 125 officers, Dental Corps; 41 officers, Veterinary Corps; 1,500 nurses; 2,000 enlisted men,

^a For details concerning shortage of Medical Department personnel consult Chap. I, Vol. VIII, of this history.

Medical Department; and approximately 2,722 enlisted men of the Veterinary Corps.²⁰ The total personnel of the Medical Department in Europe on that date was 15,407 officers, 8,593 nurses, and 126,281 enlisted men of whom 944 officers, 656 nurses, and 1,314 men were serving with the British.²⁰ Arrival of additional personnel and the decrease in the number of admissions led to a slight surplus in Medical Department personnel for the whole A. E. F., but it was soon absorbed through the return of officers and men to the United States.⁴

By November 30, 1918, Medical Department personnel totaled 163,841 officers, nurses, and enlisted men; i. e. 8.6 per cent of the American Expeditionary Forces.¹²

The following tabulation of Medical Department personnel shows the bimonthly totals from June 1 to November 30, 1918.⁴ In some cases these totals are only approximate, as reports of arrivals of personnel were often delayed in the mails.⁴

	Officers	Nurses	Enlisted men
June 1, 1918.....	5, 198	2, 539	30, 674
Aug. 3, 1918.....	9, 601	4, 735	67, 140
Oct. 5, 1918.....	14, 483	7, 522	104, 557
Nov. 30, 1918.....	17, 487	8, 951	137, 403

Medical Department personnel pertaining to the Navy also served in the American Expeditionary Forces supplementing that of the Army. In November, 1918, this personnel numbered 62 officers and 416 enlisted men. The highest number of officers, nurses, and enlisted men reported severally in the American Expeditionary Forces at any time was as follows:⁴ Officers, 18,146; nurses, 10,081; enlisted men, 145,815.

Totals were not reached by the foregoing classes of personnel simultaneously. The highest grand total of Medical Department personnel collectively was reported as follows under date of January 11, 1919.¹⁸

Officers.....	17, 767
Nurses.....	9, 994
Enlisted men.....	145, 815
Civilian employees.....	507
Total.....	174, 083

These totals should actually show as of the first week in December as there were no Medical Department arrivals subsequent to that date, but because of delay in receiving reports the full strength was not recorded finally until the week ending January 11, 1919.²¹

The grades held by this personnel and the branches of the service to which the members therein pertained were as follows:¹²

TABLE 1.—*Medical Department personnel, American Expeditionary Forces, January 11, 1919*¹²

	Brigadier-generals	Colonels	Lieutenant-colonels	Majors	Captains	First lieutenants	Second lieutenants	Total officers	Total enlisted men	Total nurses	Total civilians	Grand total
WITH UNITED STATES ARMY												
Officers:												
M. C.	3	102	302	1,409	4,315	6,672		12,803				12,803
S. C.			1	14	144	442	582	1,183				1,183
D. C.		3	9	42	321	1,430		1,805				1,805
V. C.				52	107	330	396	885				885
A. A. S.					1	27		28				28
Soldiers									139,788			139,788
Nurses										9,455		9,455
Civilians											492	492
Total								16,704	139,788	9,455	492	166,439
WITH BRITISH												
Officers:												
M. C.		3	4	25	203	624		859				859
S. C.					3	6	5	14				14
D. C.				2	5	4		11				11
Soldiers									1,313			1,313
Nurses										539		539
Civilians											15	15
Total								884	1,313	539	15	2,751
WITH FRENCH												
Officers:												
M. C.		1		2	2	3		8				8
S. C.					4	1		5				5
D. C.						2		2				2
A. A. S.			1	3	8	99		111				111
Soldiers									3,704			3,704
Total								126	3,704			3,803
WITH ITALIANS												
Officers:												
M. C.				4	10	4		18				18
S. C.						1		1				1
D. C.						1		1				1
A. A. S.		1	1		19	12		33				33
Soldiers									1,010			1,010
Total								53	1,010			1,063
Grand total								17,767	145,815	9,994	507	174,083
Weekly net loss								159		63	7	
Weekly net gain									712			483

* Includes seven contract surgeons.

The work of the personnel division increased during December, 1918, because of the large number of applications for immediate return to the United States for discharge.⁴ It was estimated that 6,000 of these applications were received, 70 per cent of them from officers who had arrived overseas after September 1, 1918.⁴ On December 2, in Circular No. 52, the chief surgeon issued instructions to personnel concerning their return to the United States. Many casual officers were released shortly after the beginning of the armistice, mainly for the purpose of returning to the United States for discharge because of their affiliation with colleges.⁴ On account of the number of these releases it became necessary to hold many other officers also desiring immediate return.⁴

General Orders, No. 4, G. H. Q., A. E. F., January 4, 1919, directed that individuals would not be discharged in Europe without specific authority—in each case from headquarters, A. E. F. If applications for discharge in Europe were approved, individuals seeking such discharge were to be sent to the discharge camp, St. Aignan. Other instructions concerning return to the United States or discharge in Europe were published during the same month by General Orders, No. 17, G. H. Q., A. E. F., January 25, 1919, and General Orders, No. 20, G. H. Q., A. E. F., January 30, 1919, and by other later orders issued by headquarters of the American Expeditionary Forces, or of the Services of Supply. Instructions on the subject were also published in Embarkation orders issued as a separate file, by headquarters, Services of Supply.²²

Release of a large number of base hospitals for return to the United States within a few weeks after the beginning of the armistice, necessitated removing certain of the junior officers from each of these units, in order to supply demands for personnel from the army of occupation and from the various base sections, and also to replace some officers of long service in the American Expeditionary Forces who had urgent reasons for return to the United States.⁴

By the middle of January, the weekly net loss of officers had reached 400, and after that date it ran from 100 to 600 each week.⁴ On March 1, it was reported that the drain on the Medical Department personnel, because of attendance at various universities, had again created a somewhat difficult situation.⁴ A large number of applications for return to the United States were now being disapproved except in unusual cases.⁴ The movement of personnel belonging to base hospitals was increasing, but it was necessary to retain at least 50 per cent of the officers of those units which had been in France less than one year, and assign them to other organizations.⁴ By March, personnel was returning to the United States at the rate of 300 officers, 300 nurses, and 2,000 enlisted men per week.¹²

The entire United States Army Ambulance Service on duty with the Italian forces was returned to the United States about April 1, 1919.⁴

On April 26, 1919, when about one-half of the American Expeditionary Forces had been returned to the United States, the Medical Department personnel remaining in France was:⁴

Officers.....	12, 544
Nurses.....	6, 238
Enlisted men.....	21, 351
Civilians.....	347

By May 31, the figures were as follows:⁴

Officers.....	9, 7 6
Nurses.....	4, 837
Enlisted men.....	95, 957
Civilians.....	243

On May 31, only one medical officer remained on duty with the British Expeditionary Forces.⁴ By July 12 the personnel status of the Medical Department was as follows:¹²

TABLE 2.—*Medical Department personnel, American Expeditionary Forces, July 12, 1919*¹²

	Brigadier generals	Colo- nels	Lieu- tenant colo- nels	Majors	Capt- ains	First lieu- tenants	Sec- ond- lieu- tenants	Total officers	Total enlisted	Total nurses	Total civilians	Grand total
WITH UNITED STATES ARMY												
Officers:												
M. C.	3	62	134	571	1,913	1,318		4,001				4,001
S. C.			3	38	188	187	219	635				635
D. C.		5	10	30	176	201		422				422
V. C.			2	12	38	89	72	213				213
A. A. S.			2	2	1	10		15				15
Soldiers									27,846			27,846
Nurses										2,239		2,239
Civilians											a 157	157
Total								5,286	27,846	2,239	157	35,528
LOSSES SINCE LAST REPORT												
Officers:												
M. C.		3	10	92	145	95		345				345
S. C.				4	7	11	15	37				37
D. C.			1	10	37	48		96				96
V. C.			2	2	4	2	6	16				16
A. A. S.					1	2		3				3
Soldiers									24,583			24,583
Nurses										473		473
Civilian											19	19
Weekly net loss								497	24,583	473	19	25,572

a Includes two contract surgeons.

The personnel status on August 31, when the American Expeditionary Forces was succeeded by the American forces in France and the American forces in Germany was as follows:¹²

TABLE 3.—*Consolidated daily field report of Medical Department personnel, S. O. S., August 31, 1919*¹²

	Officers				Enlisted men										Nurses
	Med- ical Corps	San- itary Corps	Den- tal Corps	Vet- er- i- nary Corps	Mas- ter hos- pital ser- geant	Hos- pital ser- geant	Ser- geant first class	Ser- geants	Cor- porals	Cooks	Wag- ons	Pri- vates first class	Pri- vates	Total en- listed	
Base Section No. 1	36	2	6	2	1	3	25	35	24	16	15	89	81	289	9
Base Section No. 2	25	5	4	6		4	21	30	23	11	2	93	74	258	20
Base Section No. 5	127	14	16	5	5	8	63	146	63	102	81	648	482	1,598	98
Advance section	25	1	5	1	1	3	5	19	7	3	1	49	66	154	18
Intermediate section	13	2	6	1	2	7	9	9	5	5	1	29	38	98	15
District of Paris	19	2	4		6	6	9	15	5	4		39	39	123	30
Arrondissement of Tours	16	2	2		2	1	10	14	11	9	1	45	11	104	12
Office of chief surgeon	7	7			3	10	10	6	4			4		37	1
Total	268	35	43	15	20	37	150	274	142	150	101	996	791	2,661	203

PROMOTIONS

Though the promotion section of the chief surgeon's office was never under the direct control of the personnel division, it is discussed at this point because of its close association therewith.⁴ This very important duty was under the immediate control of the executive assistant to the chief surgeon, who formulated the general plan for promotion, as prescribed in Circular No. 3, chief surgeon's office, and who gave this subject his immediate attention.⁵ He was assisted in this service by a commissioned officer who was engaged in no other duty.⁵

Early in the existence of the American Expeditionary Forces promotions were made by the War Department upon the recommendation of the chief surgeon and the Surgeon General, but this system was later abandoned and all promotions in the Medical Department had to be approved by the commander in chief.⁴

The need for making promotions in the Medical Corps of the American Expeditionary Forces was especially urgent because most Medical Reserve Corps officers were commissioned in the lowest grade (first lieutenants), originally the only grade provided under the law.⁴ Among these were capable men who had been in the practice of medicine 15 or 20 years. It was the intention of the Surgeon General that these officers be given prompt promotion as soon as their fitness for positions of increased responsibility was demonstrated; but the machinery for promotion presented unexpected difficulties in the American Expeditionary Forces, and for this reason the proportion of lieutenants at the cessation of hostilities was about 60 per cent, instead of the 14 per cent provided by law.⁴

It is certain that many of the medical officers, serving with the British especially, did not receive the promotions to which the law and the character of their services entitled them.⁴ They failed to get merited promotions, because, in addition to the obstacles, delays, and accidents which characterized the history of promotions of Reserve Corps officers serving under the immediate jurisdiction of the American Expeditionary Forces, there were the added delays incident to mail communications with the British Expeditionary Force, and the great difficulty of getting from the nine hundred or more officers on duty with the British, the reports of "Character of service and qualifications" upon which was based the roster which determined their promotions up to and including the rank of major.⁴

Very few promotions were made during the first 10 months of the American Expeditionary Forces.⁴ Those proposed by the chief surgeon were disapproved, as a rule, on the ground that a definite and methodical scheme of promotion which would do justice to all, as nearly as possible, should be presented before the commander in chief would be willing to make promotions except in very special cases.⁴ A scheme was finally worked out and presented to the commanding general, Services of Supply, on May 17, 1918, by whom it was forwarded on May 19 with the following indorsement:

Heretofore I have generally disapproved recommendations for promotions in the Medical Corps because they have come as isolated cases and presented no facts by which a reasonable judgment could be formed as to the relative merits of the particular case, in comparison with

the entire body of medical officers.⁴ As this paper presents a plan which appears to me to be comprehensive, legal, and reasonable, I approve of it and recommend that it be adopted as the basis for promotions of officers in this corps serving with the American Expeditionary Forces in Europe.⁴

The plan in question is given in Circular No. 36, chief surgeon's office, June 11, 1918, which is reproduced in the appendix of this volume. It was formally approved by the commander in chief June 27, 1918.⁴ The first list of officers recommended for promotion under it was forwarded on June 15, and five other lists in July.⁴ Later it was learned that these lists were not forwarded from general headquarters until about August 10.⁴ After that date lists sent in were forwarded much more promptly.⁴ As was true in other branches of the service, promotions of lieutenants were not cabled to Washington but were sent by courier, and even in the case of those recommended for promotion to higher grades, the inevitable delays in the War Department made the process of getting them through very slow.⁴

On September 4 the chief surgeon in common with other administrative chiefs, was informed by the adjutant general, A. E. F., that no more promotion lists were to be forwarded to Washington, as a new War Department general order on the subject of promotions (General Orders, No. 78, War Department, August 22, 1918) was en route from the United States.⁴ It was hoped that this order, which authorized the commander in chief, A. E. F., to make promotions up to and including the grade of colonel (subject to confirmation by the War Department), would greatly simplify and expedite promotions in the American Expeditionary Forces, but this expectation was not realized, the opinion having been advanced that in order to determine the question whether vacancies existed, an approved table of organization was necessary.⁴ On September 20 the chief surgeon, A. E. F., wrote to the adjutant general, A. E. F., that as the law provided that there should be a certain proportion of medical officers in each grade, the number of these vacancies could readily be determined by applying the proportions to the total number of medical officers in the American Expeditionary Forces.⁴ He added that an agreement had been made with the Surgeon General, by which the commander in chief, A. E. F., could make promotions up to the authorized proportion in each grade for the medical officers in the American Expeditionary Forces.⁴ These proportions, as established in Bulletin 59, general headquarters, A. E. F., August 16, 1918, were as follows for the Medical and Dental Corps and presumably for the Veterinary Corps:⁴ Colonel, 3.16; lieutenant col., 5.42; major, 23.70; captain, 53.90; first lieutenant, 13.82.⁴ The strength of the Sanitary Corps was 1 per 1,000 of the total strength of the military forces, the number in each grade being proportional to the number authorized by law for the corresponding grades of the Medical Corps.⁴ No grade above that of major was authorized by this order.⁴ To this the adjutant general, A. E. F., replied as follows on September 24:⁴

It will be necessary to have the War Department approve the agreement between the Surgeon General and the chief surgeon before the commander in chief will be authorized to promote by temporary appointment, subject to confirmation by the War Department, except where there is a vacancy in a table of organization authorized by the War Department.

The question of the applicability of General Orders, No. 78, to the Medical Department of the American Expeditionary Force was then taken up and

was referred to the War Department by the commander in chief in a cable dated October 11.⁴ To this the Chief of Staff replied on October 19, stating that this order did not apply to the Medical Department, but it was learned later that the negative in this cable reply was an error in coding.⁴ When the matter was again presented by the commander in chief, on October 28, for reconsideration, he was informed by cable of November 5 that his request for authority to promote medical officers was approved.⁴ The chief surgeon was informed on November 7 of this decision, but four days later the armistice was signed and all temporary promotions were stopped.⁴ The best use possible was made of this short period by securing 680 promotions, but there remained about 6,500 vacancies for men who were entitled to promotion by law and by the character of their service.⁴

On December 9, 1918, the following estimate of Medical Corps officers on duty in the American Expeditionary Forces, the legal allowances and vacancies on a basis of 1,500,000 men was formulated by the representative of the chief surgeon with the general staff.²³

ALLOWANCE

	Legal percentage	Basis, 1,500,000	On duty, American Expeditionary Forces	Vacancies
Colonel.....	3. 16	332	116	116
Lieutenant colonel.....	5. 42	569	333	236
Major.....	23. 70	2, 489	1, 543	946
Captain.....	53. 90	5, 660	4, 608	1, 052
First lieutenant.....	13. 82	1, 450	7, 432	1 5, 982
	100. 00	10, 500	14, 032	---

¹ Excess.

On January 15, 1919, a list of recommendations was forwarded for promotions, including 85 lieutenant colonels to the grade of colonel, 282 majors to the grade of lieutenant colonel, 932 captains to the grade of major, and 2,457 lieutenants to the grade of captain.⁴ These were approved and published in orders on February 17, 1919.⁴ This list did not by any means exhaust the possibilities, as there yet remained the following vacancies:⁴ 241 in the grade of colonel, 293 in the grade of lieutenant colonel, 1,151 in the grade of major, and 1,323 in the grade of captain. The regular officers recommended on this list were not promoted until about May 1, 1919.⁴ Another list of 1,171 names received favorable action on May 2, 1919, but several hundred deserving officers whose active service dated from 1917 remained unpromoted when the chief surgeon was notified that no further recommendations should be forwarded.⁴ In most of these instances the recommendations had not been forwarded at an earlier date because the medical officers whose duty it was to forward the reports of character of service and qualifications had failed to give the necessary data which were called for by the scheme of promotion, such as age, length of active service, date of last promotion.⁴

The following table shows the larger lists of recommendations for promotion made by the chief surgeon, and favorably acted upon by the War Department or general headquarters, A. E. F.:⁴

Recommended	To captain	To major	To lieutenant colonel	To colonel	Total	Where promoted
1918						
May 17		2	76	34	112	War Department.
June 15			13	8	21	Do.
June 21			1		1	Do.
July 6	40	63			103	Do.
July 15	8	16			24	Do.
July 18			11		11	Do.
July 19			2		2	Do.
July 29	120	33	8		161	Do.
Aug. 5	36	15			51	Do.
Aug. 12	74	63			137	Do.
Aug. 21	82	54			136	Do.
Sept. 4	129	52			181	Do.
Oct. 10	49	24	35	28	136	General headquarters
Oct. 27	58	27	53	3	141	Do.
Nov. 7	261	136		6	403	Do.
1919						
Jan. 15	2,290	807	225	69	3,391	Do.
Apr. 19	764	321	83	3	1,171	Do.
	3,911	1,613	507	151	6,182	

Many of the officers recommended for promotion in the list of January 15, 1919, did not receive it because of delay in announcing the promotions and the fact that before this was accomplished these officers had sailed for the United States.⁴

Similarly, of those officers whose promotions were announced on February 17, 1919, 419 officers did not notify the personnel division of the chief surgeon's office or general headquarters of their acceptance of commission, the majority of them having sailed for the United States within a very few days of the date they would have received their promotions.⁴

Delays in promotion were attributed by the chief surgeon to the following circumstances:²⁴ Delays in the personnel section, general headquarters, A. E. F.; delay due to transmission to Washington, and in securing prompt action there; delay of two months due to discussion concerning applicability of General Orders, No. 78, War Department, 1918, to the Medical Corps; discontinuance of promotion for some months after the armistice began.

THE SANITARY CORPS

Under laws enacted prior to the World War none except a person holding a doctorate degree in medicine or denistry could be commissioned in the Medical Department; however, after we entered the war, and in order to meet the need for sanitary engineers, chemists, administrators, etc., a new branch of the Medical Department, entitled the Sanitary Corps, was organized under the authority granted by the act of May 18, 1917.²⁵ The officer personnel of this new corps was not to exceed one-tenth of 1 per cent of the total Army strength; the number of enlisted men was to be determined by the Secretary of War.²⁵ The number of officers in the several grades was to be proportionate to that of corresponding grades of the Medical Corps, but, as originally prescribed, no grades were provided for in the Sanitary Corps above the grade of major.²⁵

STRENGTH

The Sanitary Corps in the American Expeditionary Forces comprised officers, already commissioned, who were sent to France, and others commissioned overseas.²⁶ In order that vacancies in this corps would not all be filled

by men sent from the United States, on May 25, 1918, General Pershing notified the Surgeon General that he desired to hold vacancies in the Sanitary Corps, in units already overseas, for men to be promoted from such units, and that he did not wish to have additional Sanitary Corps officers sent to France to fill the positions.²⁷ Eventually, this arrangement brought up the question as to how many persons could be commissioned in the Sanitary Corps in France, so on October 30, 1918, General Pershing sent another cablegram to the War Department, in which it was asked how the strength of the Sanitary Corps was to be determined and what proportion would be allowed in each grade.²⁸ On November 8, War Department answered to the effect that under General Orders, No. 80, War Department, 1917, the allowances of the Sanitary Corps were colonels, 1; lieutenant colonels, 5; majors, 111; captains, 936; first lieutenants, 975; second lieutenants, 802.²⁹

The strength of this corps increased gradually until 1,185 of its officers were serving in the American Expeditionary Forces on January 4, 1919.¹² This number amounted to 7.03 per cent of all officers of the Medical Department, A. E. F.¹²

PROJECT FOR TRANSFERRING CERTAIN AMERICAN RED CROSS PERSONNEL TO SANITARY CORPS

On October 3, 1918, the commander in chief notified the Secretary of War that the American Red Cross representative and the chief surgeon, A. E. F., desired that such parts of the American Red Cross personnel as were serving the armies in Europe be incorporated in the Sanitary Corps.³⁰ The commander in chief approved this policy in order that coordination might be perfected, and requested that the Sanitary Corps of the Army be enlarged sufficiently to permit such absorption, that he be authorized to enlist American Red Cross personnel and to make appointments of American Red Cross officers in appropriate grades of the Sanitary Corps.³⁰ This authorization he asked for was to include 1 colonel, 2 lieutenant colonels, and others in grades proportional to those provided for in existing orders.³⁰ The number of officers to be commissioned under the authority thus requested would not exceed 750 and the number of enlisted men would not exceed 1,500.³⁰ It was not intended that this absorption of American Red Cross personnel would change materially the duties in which that organization was engaged.³¹

On October 11, the commander in chief further cabled that it was not intended that American Red Cross officers should be appointed in the Sanitary Corps unless they were mentally, morally, and physically qualified.³¹ He added that commissioning officers from the American Red Cross should not give members of other societies grounds for urging like action for their own members, for the reason that the American Red Cross personnel serving the armies were performing the same duties as was the Medical Department of the Army.³¹ He expected that American Red Cross officers appointed in the Sanitary Corps would remain, in general, in their then duties but would be subject to general assignment.³¹

This project for the transfer of American Red Cross personnel to the Sanitary Corps never materialized.³²

DUTIES

The majority of the officers of the Sanitary Corps in the American Expeditionary Forces were assigned to hospitals where they discharged such duties as adjutant, mess officer, and property officer.²⁶ On the whole, however, the duties discharged by officers of the Sanitary Corps were quite diversified, comprising, in addition to those referred to above, duties as accountants, architects, interpreters, opticians, those connected with certain phases of gas defense, and in connection with rodent destruction.²⁶

PROMOTIONS

In this corps, as in other branches of the Medical Department, promotions were not commensurate with vacancies. On April 19, 1919, to cite but one illustration, the chief surgeon recommended that promotions be made in the Sanitary Corps to fill the vacancies then existing.³³ Those in the grade of lieutenant colonel then numbered 59; major, 126; captain, 162; while excess proportions of officers in the grade of first and second lieutenants, respectively, were 22 and 327.³³

CONTRACT SURGEONS

The few contract surgeons in the service of the Medical Department overseas, like medical officers, were directly under the jurisdiction of the chief of the personnel division, and not of any separate section of his office.⁴ The general circumstances in which they were employed are discussed in the first volume of this history. The authority enjoyed by the Surgeon General to employ contract surgeons subject to the approval of the Secretary of War³⁴ was also delegated to the chief surgeon, A. E. F.³⁵ Among their number were women who were engaged as anesthetists, laboratory technicians, and in certain other duties as required. The total number of men and women serving as contract surgeons in the American Expeditionary Forces was 13, of which number there were 2 men³⁶ and 11 women.³⁷

PERSONNEL^a

(July 28, 1917, to July 15, 1919)

Maj. Gen. M. W. Ireland, M. C., chief.

Col. E. M. Welles, M. C., chief.

Col. W. H. Thearle, M. C.

Lieut. Col. J. S. Coulter, M. C.

Lieut. Col. J. W. Meehan, M. C.

Maj. W. Denison, M. C.

Maj. Clarence S. Ketcham, M. C.

Maj. E. H. Rogers, San. Corps.

Capt. J. H. Mael, San. Corps.

Capt. P. J. Skelly, San. Corps.

First Lieut. A. S. Callaway, San. Corps.

First Lieut. D. E. Mannix, San. Corps.

^a In this list have been included the names of those who at one time or another were assigned to the division during the period July 28, 1917, to July 15, 1919.

There are two primary groups—the heads of the division or the section and the assistants. In each group names have been arranged alphabetically, by grades, irrespective of chronological sequence of service.

REFERENCES

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- (2) War diary, chief surgeon's office, A. E. F., September 5, 1917.
- (3) War diary, chief surgeon's office, A. E. F., March 24, 1918.
- (4) Report from the chief surgeon, A. E. F., to the Surgeon General, U. S. Army, May 1, 1919. Subject: Activities of the chief surgeon's office to May 1, 1919. On file, Historical Division, S. G. O.
- (5) Report from Maj. Edward M. Welles, jr., M. C., chief of personnel division, A. E. F., to the Surgeon General, U. S. Army, April 10, 1924. Subject: Personnel activities. On file, Historical Division, S. G. O.
- (6) Report from Col. W. L. Keller, M. C., director of professional services, A. E. F., to the chief surgeon, A. E. F., December 31, 1918. Subject: Brief outline of the organization and activities of the professional services between April, 1918, and December 31, 1918. On file, Historical Division, S. G. O.
- (7) Report from Col. J. F. Siler, M. C., director of laboratories and infectious diseases, to the chief surgeon, A. E. F. (not dated). Subject: Activities of the division of laboratories and infectious diseases, from August, 1917, to July, 1919. On file, Historical Division, S. G. O.
- (8) Letter from the chief surgeon, A. E. F., to Maj. W. J. L. Lyster, M. C., June 11, 1917. Subject: Administration of American medical personnel serving with British Service. On file, Record Room, S. G. O. (9795).
- (9) Official report from the chief of the U. S. Army Ambulance Service with the French Army, April 15, 1919, by Col. Percy M. Jones, M. C. On file, Historical Division, S. G. O.
- (10) Circulars, chief surgeon's office, A. E. F. No. 36, June 11, 1918; No. 38, July 11, 1918; No. 45, August 13, 1918; No. 50, October 4, 1918; No. 54, November 9, 1918.
- (11) Report of the Medical Department activities of Base Section No. 5, including Naval Base Hospital No. 5, compiled under the direction of, and submitted by, the base surgeon, to the chief surgeon, A. E. F. (undated). On file, Historical Division, S. G. O.
- (12) Weekly numerical reports of personnel of the Medical Department, A. E. F. On file, Historical Division, S. G. O.
- (13) Report of strength of the A. E. F., by months, as shown by the consolidated returns for the American Expeditionary Forces. On file, Returns Section, Miscellaneous Division, A. G. O., January 12, 1924.
- (14) Report of Medical Department activities at Naval Base Hospital No. 1 (undated), by the commanding officer. On file, Historical Division, S. G. O.
- (15) Report of the Medical Department activities of the 2d Division (undated) by the division surgeon. On file, Historical Division, S. G. O.
- (16) Report on movement of surgical teams (undated) by the director of professional services, A. E. F. On file, Historical Division, S. G. O.
- (17) Wadhams, Sanford H., Col. M. C., and Tuttle, Arnold D., Col., M. C.: Some of the Early Activities of the Medical Department, A. E. F. *The Military Surgeon*, Washington, 1919, xlv, No. 6, 636.
- (18) War Diary, chief surgeon's office, A. E. F., January 11, 1919.
- (19) Report from the chief surgeon, A. E. F., to the commanding general, A. E. F., April 17, 1919. Subject: Medical Department activities, A. E. F., to November 11, 1918. On file, Historical Division, S. G. O.
- (20) War Diary, chief surgeon's office, November 20, 1918.
- (21) Report from the chief surgeon, A. E. F., to the commanding general, A. E. F., March 20, 1918. Subject: Activities of chief surgeon's office. On file, Historical Division, S. G. O.
- (22) Embarkation Instructions, Headquarters, Services of Supply No. 1, November 20, 1918, to and including No. 30, August 7, 1919. On file, A. G. O., World War Division, 321.1 (Embarkation Service).

- (23) Memorandum from Lieut. Col. E. M. Welles, jr., to Col. S. H. Wadhams, M. C., deputy of chief surgeon with General Staff, December 9, 1918. Subject: Table showing allowance of officers of all grades for A. E. F. on a basis of 1,500,000 men. On file, A. G. O., World War Division, chief surgeon's files (320.21).
- (24) Letter from the chief surgeon, A. E. F., to Maj. James A. Shannon, Inf., chief of personnel, General Headquarters, August 4, 1918. Subject: Promotions. On file, Historical Division, S. G. O.
- (25) General Orders No. 80, W. D., Washington, D. C., June 30, 1917.
- (26) Statement based on a study of general correspondence concerning the Sanitary Corps. On file, World War Division, A. G. O., chief surgeon's files (211.234).
- (27) Cable No. 1178-S, par. 5, from General Pershing to Chief of Staff and Surgeon General of the Army, May 25, 1918.
- (28) Cable No. 377-S, par. 1, from the chief surgeon, A. E. F., to The Adjutant General, U. S. Army, for the Surgeon General, October 30, 1918.
- (29) Cable No. 252-R, par. 2, from the Surgeon General to the chief surgeon, A. E. F., November 8, 1918.
- (30) Cable No. 1738-S, par. 1, subpar. D, from General Pershing to The Adjutant General of the Army, October 3, 1918.
- (31) Cable No. 1780-S, par. 1, subpar. C, from General Pershing to The Adjutant General of the Army, October 11, 1918.
- (32) Cable No. 2095-R, par. 1, from The Adjutant General of the Army to General Pershing, October 23, 1918.
- (33) Letter from the chief surgeon, A. E. F., to the commander in chief, April 19, 1919. Subject: Promotions of officers in the Sanitary Corps, Medical Department. On file, A. G. O., World War Division, chief surgeon's files (211.234).
- (34) U. S. Compiled Statutes 1916 (act of February 2, 1901, C. 192, sec. 18), 31 Stat. 752.
- (35) Memorandum from legal reference section to Capt. E. J. Berry, S. C., January 10, 1919. Subject: Contract surgeons. On file, A. G. O., World War Division, chief surgeon's files (211.26).
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CHAPTER VI

THE DENTAL SECTION

The dental subdivision of the chief surgeon's office, though part of the personnel division,¹ was in a large degree separate therefrom.² Because of its relationship with the personnel division, its activities are considered here, though these were of a much wider character than control of dental personnel alone. It exercised both general and technical control over all matters affecting the dental service throughout the American Expeditionary Forces; e. g., dental laboratories, procurement and distribution of dental supplies, dental organization, professional dental service, and liaison with the maxillofacial services.²

In view of the fact that the dental service was not classed among the professional services and, therefore, can not logically be discussed with them in another part of this volume or in others, it appears expedient to consider here not only the activities of the dental section of the chief surgeon's office, but of the administrative activities of that service as a whole.

On June 12, 1917, General Pershing cabled through the American ambassador, London, to the Secretary of War, requesting that the senior dental officer of the Army be sent to France with the second convoy of troops, there to establish a depot and organize work, and that dental officers be sent with all troops in proper proportion.³ Confidential orders were issued by the War Department, June 25, 1917, in compliance with the above request.⁴ During a conference with the Surgeon General of the Army, prior to embarking, the dental officer in question made request for authority to organize and take with him a dental corps unit, to be composed, with himself, of six specially qualified dental surgeons.² This request was granted, the necessary telegraphic orders were issued, and the members of this unit assembled in New York City, July 10-15.² Regulation field equipment and supplies, with which the five officers, other than the chief of this group were supplied, were augmented through purchase of complete laboratory equipment and supplies, and special oral surgical instruments and appliances.² Transportation was secured with the second convoy, due to sail on or about July 28.²

During the latter part of June the Surgeon General had also requested orders directing 20 members of the newly organized Dental Service Corps to proceed to New York for transportation with the second convoy of troops.² Several members of this corps, attached to Base Hospitals Nos. 8 and 9 and to the First Regiment of Engineers, were at this time also assembled at the port of embarkation, and a total of approximately 30 dental officers were provided transportation with the second convoy.² Unfortunately, all the equipment and supplies of the First Army Dental Corps Unit was submerged in the sinking of the vessel on which its members were embarked, and though a large portion of the equipment and supplies was rescued several weeks later, it proved worthless and a total loss.² The unit was reequipped by the local medical supply depot and finally sailed early in August, 1917.²

Upon arrival in France, all the dental officers destined for organizations of the 1st Division proceeded to the division training area to join their commands; those attached to base hospitals accompanied these organizations to their station, and all personnel of the First Dental Corps Unit proceeded in accordance with their orders to headquarters, A. E. F., then in Paris, where, on August 22, 1917, the head of this group reported to headquarters.² He was then directed to report to the chief surgeon for duty as assistant in matters pertaining to the dental branch.⁵

Plans for the organization of the Medical Department, A. E. F., already under way, contemplated the utilization of dental personnel in several newly created administrative positions. At a conference in the chief surgeon's office, it was decided that the First Dental Corps Unit should be broken up and its personnel assigned to stations where technical administration and supervision would be required.² Its members were then individually assigned to the office of the chief surgeon; headquarters, Field Artillery brigade, Le Valdahon; headquarters, 1st Division, Gondrecourt; Medical Supply Depot, Cosne; headquarters, field hospital company, 1st Division, Gondrecourt training area; and to the dental clinic at headquarters, A. E. F.²

Throughout the war, the dental section continued to function as a part of the personnel division in the chief surgeon's office, moving with it to Chaumont on September 1, 1917, and later to Tours in March, 1918.²

When headquarters, A. E. F., were moved to Chaumont, a headquarters dental clinic was established there.² Here two complete field outfits and a laboratory were installed under direction of the senior dental surgeon, and began operating within 48 hours after the establishment of headquarters. This establishment continued its activities until the last day those headquarters remained at Chaumont.²

During September and October, 1917, plans were formulated and their application inaugurated for an organization which would direct and control the dental service of the great number of troops expected.² Consideration was given to providing administrative positions whose occupants would supervise the professional and official service of dental officers on duty with major commands; to the assignment of specially selected dental officers to supply depots and service schools, and to provision of professional consultants of chief clinicians at important hospitals and of oro-dental specialists qualified for service at maxillofacial hospitals.² The organization of the office of the senior dental surgeon was completed and plans were made for the instruction of all dental officers holding administrative positions.² Instruction was given to a large degree by means of correspondence between the chief of the dental section and his subordinates. This was supplemented by his frequent inspections at the several divisions and hospitals within the training areas. Instruction of division dental surgeons began with the establishment of a school for them in the 1st Division on September 15.²

On October 12, 1917, a cablegram was received from the Surgeon General's office, announcing that the Army Dental Corps reorganization bill had been signed by the President on October 6, 1917.² Office orders were then issued assigning the senior dental surgeon to duty as chief dental surgeon, under general

direction of the chief surgeon, A. E. F., and on October 27 his duties became wholly those of an administrator and director of the dental service, A. E. F.² Though technically belonging to the personnel division of the chief surgeon's office, he was provided a separate office and clerks. During October and November, further consideration was given to the preparation of adequate plans for the organization of the Dental Corps on the comprehensive lines necessary to meet the need of an army of 1,000,000 men.²

Shortly after the arrival of the chief surgeon's office at Tours, in March, 1918, the office personnel of the dental section was increased by 2 sergeants, Medical Department, for the record room and 1 additional enlisted stenographic clerk.² Thereafter from time to time the division expanded to meet the requirements of increased service until, in addition to the commissioned personnel, it had a maximum of 4 stenographers and 9 record clerks.²

Until June, 1918, the only officer serving in the dental section was the chief dental surgeon; another officer charged with procurement and distribution of dental supplies was then assigned, and in September, 1918, this personnel was reenforced by a third officer.²

ORGANIZATION OF THE DENTAL SERVICE

Though the organization which the Dental Corps finally developed was begun early in the history of the American Expeditionary Forces, its completion in a satisfactory manner was not practicable until after the bill reorganizing the corps became a law on October 6, 1917.² By this organization, each division was allowed 30 dental officers, under direction of a senior, the division dental surgeon.² The latter was under the general direction of the division surgeon and was charged with the responsibility of coordinating, supervising, directing, and inspecting the dental service of the division.² The senior dental officer with regiments which required more than one dental surgeon was designated regimental dental surgeon and charged with the responsibility of conducting the service of his specialty. When army corps were organized it became necessary to appoint corps dental surgeons, who were under general directions of the corps surgeon. These administrative officers were charged with the coordination and direction of all the dental service of their respective army corps, which included the inspection, supervision, and instruction of the several division dental surgeons, and supervision and control of all dental officers assigned to duty with corps troops.² After the organization of field armies, experienced dental officers were assigned to duty as army dental surgeons, under general direction of the army surgeons and were charged with the responsibility of supervising and coordinating the dental service in the respective commands in which they served, including the dental service of divisions, corps, army troops, evacuation, and mobile hospitals. Their administrative activities pertained chiefly to the service of dental surgeons of corps and divisions. Those officers rendered reports to them through medical department channels and their own reports and returns were made in turn, through medical department channels to the chief surgeon, A. E. F.² In the Services of Supply a supervising dental surgeon in charge of the service of his specialty in each section (including the district of Paris) was vested with the responsibility of coordinating and con-

ducting the service under general direction of the surgeon. He also submitted reports and returns, through medical channels, to the chief surgeon. Hospitals centers, depot divisions, replacement depots and later, embarkation areas were provided with local dental supervisors, usually selected from among the senior dental officers of those commands.² Their duties, in addition to those of a professional character, were the centralization and coordination of the professional service and supply of the dental department in their respective jurisdictions under general direction of the senior medical officer through whom their reports and returns were rendered to the chief surgeon.² In all of these organizations large dental infirmaries were established in favorable locations where a number of dental surgeons were assigned under centralized control.² Each hospital in the American Expeditionary Forces was staffed and equipped for dental service.⁶ Base and evacuating hospitals usually had two dental officers equipped with complete base outfits and laboratories; all other hospitals had at least one dental officer equipped with operating outfit only.⁶

In the early fall of 1917, the French turned over the artillery training area at Mailly to the American forces for the development of Coast Artillery organizations.² As the dental officers who accompanied the first American organizations moving into this area were all recently appointed from civil life, it was necessary to send an experienced officer to organize and coordinate their services. This he accomplished partly through the establishment of a small school of instruction.²

The general plans for the organization of the dental service, A. E. F., were made and tentatively approved early in its history. The approval, however, had the provision that none of them would be put into effect until called for in the general scheme for the organization of higher commands.² Such organization, however, was immediately initiated for the units of the expedition then present and the 1st Division being well advanced in its combat training, was the first to receive the benefits accruing from this development.² Among other provisions, orders were issued announcing a division dental surgeon and providing for dental inspection, technical supervision, a headquarters dental clinic, and schools.² When in the early fall of 1917, the 2d Division moved into its training area with headquarters at Bourmont, dental officers were assigned to its several units.² No division dental surgeon had been sent over with it, but one was designated from the American Expeditionary Forces in the latter part of November. Under his direction the dental service of this division was organized, a division school established and the other activities were thoroughly coordinated. Like action was taken for the 26th and 42d Divisions.²

An important development within each combat division area was the establishment of a headquarters dental clinic.² Each of these clinics was served by competent operators and was fully equipped, including complete laboratories; each was technically in charge of the division dental surgeon who was responsible for its efficient management. Later, when divisions entered upon the last phase of combat training, instructions were issued for organization within each division of a portable dental laboratory.² This unit was placed in charge of a selected dental officer conversant with dental labora-

tory practice, who was assisted by a specially qualified dental mechanic. This laboratory, which assumed the necessary prosthetic service for the division and obviated need of transferring patients to points outside its command, usually was located at the division field hospital, which was farthest from the line. After our divisions assumed combat activities, this unit assisted in first aid at the front.²

When the line of communications was organized in August, 1917, with headquarters in Paris, all dental surgeons except those attached to divisions, detached combat organizations, or to base hospitals, came under control of the line of communications and were assigned by its headquarters to duty with detached commands in its several sections.² A headquarters dental clinic was organized in the headquarters of the line of communications, its first equipment consisting of the old type portable dental outfit, with which all dental officers arriving from America were supplied. This equipment was augmented by complete base dental outfits for two operators and one complete laboratory.²

After removal of headquarters, line of communications, to Tours, in June, 1918, this clinic, remaining in Paris, became known as the attending dental surgeon's office, district of Paris.² It was increased in size by the assignment of additional dental officers with full base equipment to meet the growing requirements of its service, and continued to function until withdrawal of the American Forces in France from the district of Paris toward the end of 1919.²

When the advance section was organized in the latter part of February, 1918, a supervising dental surgeon was assigned to it, and the office of the chief dental surgeon thereby relieved to an appreciable extent.² This supervising dental surgeon was charged with the supervision and coordination of all elements of the dental service throughout his jurisdiction. The majority of troops then in the area were widely scattered; e. g., engineer organizations making preparation at a number of camps for the early arrival of large numbers of American troops, and signal corps battalions installing telegraph and telephone lines.² Many other detached organizations were later located throughout this section.² The dental officers attached to these several commands were all under the technical direction and instruction of the supervising dental surgeon, advance section.²

Approximately 35 dental officers were serving within the advance section at the time of its organization. This number was more than doubled thereafter until November, 1918. But their number remained short of that required and it became necessary to assign several of them to an itinerant service in order that they might visit some of the smaller units.²

The intermediate section, Services of Supply, with headquarters at Nevers, was in operation for some time without organized dental service, but increase of the various activities throughout its area and the arrival of dental officers, newly appointed from civil life and unacquainted with military procedure, necessitated the appointment in April, 1918, of a section dental surgeon.⁷ The duties of this officer were similar in every respect to those outlined above for the supervising dental surgeon, advance section.²

The wide dispersion of troops in the intermediate section also presented many difficulties in the furnishing dental service; furthermore, some organizations were much expanded after arrival in France; e. g., an engineer regiment which landed with approximately 2,000 men had expanded before the end of activities to a strength of 20,000.² Since the legal allowance of dental officers for the American Expeditionary Forces was based on the proportion of one dental officer to every 1,000 men, and as units were organized when they sailed, it was not practicable to supply dental officers in a corresponding degree to those units which were expanded overseas.²

The organization of the dental service for base sections began with the appointment of a supervising dental surgeon for base sections Nos. 1, 2, and 5 in April, 1918.² Owing to the shortage of experienced dental officers of field grade, it was necessary to utilize one officer to organize the dental service for the three sections. While it was appreciated that it would be difficult for one officer to exercise dental supervision of three important base sections, this arrangement was maintained for several months.² In December, 1918, a supervising dental surgeon was appointed for base section No. 1 (St. Nazaire) and in the same month another for base section No. 2 (Bordeaux).² This position in base section No. 5 was at first filled by a temporary assignment but later a permanent detail was made. The supervising dental surgeon of a base section discharged duties similar to those mentioned above in connection with the advance section, but he also exercised technical supervision over the receipt and storage of dental supplies arriving at the port and organized and developed dental clinics at section headquarters and at the disembarkation camps where troops were held temporarily.²

No supervising dental surgeon was designated for base section No. 3, for the surgeon of that section considered such an assignment unnecessary.²

Base section No. 4 having comparatively few American organizations or activities, was therefore never provided with a supervising dental surgeon. The dental service of the permanent command and of detached organizations there was supplied by dental officers assigned to organizations temporarily within the section.² A supervising dental surgeon for base section No. 6 was not appointed until December, 1918.²

The dental service in the large areas occupied by depot divisions had to be expanded in order that adequate clinics might be established in the several billeting towns and camps. In the First and Second Depot Division areas this was effected by the division dental surgeons, each of whom also organized and equipped a central dental clinic and dental laboratory.² The establishment provided at St. Aignan (First Depot Division) proved a model for this type of clinic, being the first organized for group dentistry. Later, in order to meet local requirements, a course of instruction was carried on in the first depot division area in order to develop dental assistants from selected young men serving in medical detachments of the division concerned.²

At the five replacement depots, located, respectively, near Amiens (with the American Second Corps), to the northwest of Paris, adjacent to St. Dizier, adjacent to Toul, and near the town of Meaux, the dental service was similar in every respect to that of the First Depot Division.² It comprised the organi-

zation of large dental clinics where the mouths and teeth of soldiers passing through the depot might be placed in first-class condition without appreciable loss of time. These clinics gave full opportunity for group dentistry and proved of the greatest value as time-saving expedients.²

PERSONNEL

The total number of officers who served in the Dental Corps, A. E. F., was 1,876.⁸ The highest officer strength of that corps was 1,805, which it attained on January 11, 1919.⁸ Of these officers 79 belonged to the Dental Corps, United States Army, 12 to the Dental Corps, United States Navy, about 225 to the National Guard, and the others to the Dental Reserve Corps.⁸

The total personnel, including enlisted men of the Medical Department assigned to its service, approximated 4,000, of whom more than 2,000 (including the officers above mentioned) were graduate dentists.⁸ The enlisted men, Medical Department, assigned for duty to the Dental Corps served either as dental assistants or as dental mechanics. Many of them were undergraduates in dentistry.⁸

The full quota of commissioned dental personnel authorized at the rate of 1 to 1,000 men was never attained in the American Expeditionary Forces, and there was a shortage of over 300 dental officers at the time the armistice was signed.⁸ A dental officer was sent with approximately every thousand men of large organizations embarking from the United States, but this ratio was not extended to small organizations and to casualties, so that a shortage accrued for the American Expeditionary Forces as a whole.⁸ This shortage was most apparent in organizations that greatly expanded overseas, as noted above. Furthermore, it was found necessary to give three dental officers to each combat division in excess of the pro rata allowance, because of the fact that certain units; e. g., field signal battalions, machine-gun battalions, with less than 1,000 men each, operated as separate organizations.⁸ But after the armistice began a general plan for equalization was carried out whereby each command was assured of dental service. The full quota eventually was reached by reassignment of about two-thirds of the dental personnel from each division sent home, for only a skeletonized dental force was authorized to return with the division which it had served.⁸ That contingent remained with the division for the purpose of rendering professional services during the voyage. This practice of retaining part of the divisional personnel was discontinued in April, 1919.⁸

Though the great majority of dental officers came from the United States, either with troops or as casualties, several American dentists, among other patriotic citizens already in Europe, offered their services shortly after American headquarters were established in France.² It was announced that the policy of the Medical Department would be to accept the services of all physicians and dentists, subject to a professional examination which would determine that they were professionally qualified.² Five approved civilian candidates were eventually commissioned in the Dental Corps after examinations and a considerable number of enlisted men were also examined for temporary commissions in the Dental Corps.² A total of 123 passed their examinations in

France, but only 40 of these were enabled to serve as officers on account of a War Department decision not to commission after the armistice began candidates who passed the examination.² Recommendations were made to the adjutant general, A. E. F., that the 83 successful candidates who had not been commissioned at the time of the signing of the armistice be appointed and commissioned in the grade of first lieutenant, Dental Reserve Corps (inactive status), and that their commissions be given them as a reward of merit on the date of their final discharge from the Army.² This recommendation was approved and was largely carried out. In many instances, however, the commissions were not forthcoming until several months after discharge.² The regular Dental Corps was increased by nine officers through appointments made in the American Expeditionary Forces from the Dental Reserve Corps.²

While the majority of dental officers of the American Expeditionary Forces served in France, a large number arriving with organizations in England were detained there temporarily or permanently for duty at our several hospitals, aviation camps, and instruction centers.⁸ Several dental officers were detailed for duty with organizations serving in Italy and northern Russia, and in March, 1919, 20 dental officers, with enlisted assistants and full portable outfits, were sent to the United States military mission, Berlin, Germany, for special duty in the Russian military prison camps.⁸

During the fall of 1917 it was announced that the six American base hospitals then loaned to the British would eventually come under control of the American Expeditionary Forces, but this was never actually accomplished.² Nevertheless, a number of medical and dental officers belonging to these units were detached and assigned to service in the American Expeditionary Forces. Thirteen dental officers were obtained in this manner.²

SCHOOLS

Division schools for the instruction of recently joined and inexperienced dental reserve officers were established in the early fall of 1917.² It was recognized that these officers, however well qualified professionally, were unacquainted with methods of conducting a military dental practice, with customs of the service, the system of obtaining supplies, military correspondence, and the formulation of reports and returns.² The instruction, therefore, considered the methods of conducting a military dental practice, duties of an officer, customs of the service, procurement of supplies and equipment, preparation of reports and records. The division dental schools were in charge of the division dental surgeons and under general direction of the division surgeon concerned.² Sessions were held two afternoons a week. The advantages of this instruction were soon apparent in the dental service of the 1st Division, in which the first school of this character was established, and which became the model for the dental section of the Army sanitary school. Similar schools were conducted in all the other early divisions in France.²

The plan for division instruction was changed in November, 1917, by the organization of the dental section of the Army sanitary school at Langres.²

With a full realization that a large number of specially qualified officers, both medical and dental, would be needed for face and jaw surgery, immediately

upon entry of the American Army into combat activities, preparations were made to establish a post-graduate course of instructions in oral, plastic and prosthetic surgery.² This was conducted at the American Red Cross Military Hospital No. 1, Neuilly, which was selected for this purpose because of its central location and the excellence of the facilities which had long been established there.² A competent faculty of well-qualified and experienced instructors was assembled at this hospital, under the direction of a colonel of the Medical Corps.² The several subjects of the curriculum were as follows: Special anatomy, bacteriology and infections, face and jaw fractures, plastic surgery, oral surgery, prosthetic surgery (fracture appliances), postoperative care, Roentgenology and photography, anesthesia, and Medical Department administration in war.²

A schedule for lectures and clinical instruction was prepared and it was planned that the school would open in January, 1918, but this was deferred until March.² Owing to the enemy offensive, which started March 21 and the necessity for using in large degree as evacuation hospitals all hospitals in the Paris district, this important course was indefinitely postponed.² It was finally abandoned on account of the continuous battle activities immediately north of Paris and because of the arrival in March, 1918, of 40 medical and dental officers, specially trained in maxillofacial surgery. The availability of these officers, obviated any need for the school. They were organized with teams and distributed as described below.²

A school for the instruction of enlisted men as dental assistants was early organized at headquarters, First Depot Division, St. Aignan.² Through diligent investigations conducted in the several units of the 41st Division, now designated First Depot Division, and of the several casual groups arriving from the United States as replacement troupes, several hundred young soldiers were found and brought to this school for instruction as dental assistants. A large percentage were undergraduates in dentistry who in consequence readily took up this special work. They were given an intensive course of instruction and upon its completion were awarded certificates of proficiency. A list of each class was sent to the chief surgeon, A. E. F. who made assignments from it throughout the dental service.²

In order to meet the demands for competent laboratory assistants—dental mechanics—a school was organized at the central dental laboratory headquarters, First Depot Division, in^o extension of the course for dental assistants.² The men sent here were given intensive instructions in primary laboratory work for a period of one month. Upon its completion they were classified and those rated as most proficient were sent to a second school for dental mechanics, which was established in the dental laboratory at American Red Cross Military Hospital No. 1, Neuilly.² Here they were given advance instruction in dental and oral surgical prosthesis, which comprehended the construction of swaged and cast-metal splints and all other fractured jaw appliances required in maxillofacial surgery. Upon completion of a six-week course of instruction, the graduates were given certificates and assigned to duty at the various base hospitals where this special type of surgery was being conducted.²

After the armistice began a school for instruction of dental assistants in oral hygiene and prophylaxis was organized at headquarters, Base Section No. 2, Bordeaux. It admitted students selected from among 400 enlisted men and gave them instruction on a number of subjects pertaining to the practice of dentistry. On graduation these men were assigned to service at the larger clinics.²

In February, 1919, the American University was established at Beaune.² Its dental department began work on March 12, 1919, being the first department to open.²

During the autumn of 1918 a special course of clinical instruction was conducted in dental and maxillofacial prosthesis by the senior consultant in prosthetic dentistry. This officer visited each hospital center and important base hospital and then gave instruction to officers and dental mechanics in the highly specialized technique of maxillofacial prosthesis.²

SUPPLIES AND EQUIPMENT

Originally the types of dental equipment for the American Expeditionary Forces were those prescribed by the Surgeon General, viz, portable dental outfits for dental officers attached to field organizations, and the base dental equipment (as far as practicable) for all base hospitals.⁴

The plans promulgated by the headquarters, A. E. F., in the summer of 1917, for the shipment of all Army supplies provided for a reserve of approximately four months, but requisitions issued by the Medical Department for the shipment of supplies for the 1st Division included approximately a five months reserve.⁴ Its subsequent instructions in regard to the 2d, 26th, 42d, and 41st Divisions contemplated but a four months reserve and thereafter until the inauguration of the automatic supply table, excess supplies were issued on the basis of three months reserve. The plan contemplated the storage of 15 days supply at the advance depots, 30 days supply at the intermediate depots, and 45 days supply at base sections. While this plan was never completely followed, it proved of value as it assured storage in France of a reserve supply. The plan was materially changed after the adoption of the automatic supply system which became effective in March, 1918.²

The Medical Department automatic supply table was prepared after due consideration and elaborate study based on plans outlined by the general staff in the summer of 1917. Six months experience and observation were utilized in its formulation and preparation. The dental department participated in its preparation in so far as its own supplies were concerned.²

The dental tables of the automatic supply were formulated to meet actual requirements of portable dental outfits for the 30 dental officers authorized for each combat division, for the outfits of the various detached commands in the Services of Supply, and for normal replacement of these assignments.² The calculations for base dental outfits were made upon the requirements of hospitals which pertained to divisions and of those that were to be stationed in the Services of Supply plus the normal replacement for equipment of this character.² The arrival of certain kinds of dental equipment and supplies was delayed by the priority shipment of other articles—rations, clothing, ammunition, etc.—by con-

gestion at the ports of embarkation and debarkation, by lack of adequate facilities at the base ports for systematic storage and by lack of facilities for prompt movement by rail to place of destination.² Because of this delay it was necessary to make some emergency purchases of dental equipment and supply in France, through the medical member of the general purchasing board in Paris.² With a view of facilitating these special purchases, a dental officer was assigned temporarily to duty with that board. Until the automatic supply became effective and continuous the purchase of certain articles of dental equipment was conducted on so great a scale as seriously to embarrass the French market.² The French authorities soon observed this situation and placed an embargo on the further purchase of dental supplies by the American Army, but upon our protest to this inhibition the embargo was raised for a few weeks and further purchases were authorized to the value of 1,000 francs per month.² The demands for laboratory equipment were so great and the supply so limited in France that it was necessary to investigate the possibilities of purchasing this type of equipment in England.² The supply officer for the Medical Department who was ordered to London for this purpose succeeded in purchasing laboratory equipment and supplies in amounts considered sufficient to last until material of this type was received from the United States, through operation of the automatic supply table.² The British War Office, on observing the depletion of this type of special material, also placed an embargo on further purchases of it by the American Army. None of this much-needed laboratory equipment which had been purchased by the medical supply officer in England ever reached France, for the British vessel on which it was shipped was sunk by enemy submarines.²

The original plans for shipment of dental equipment contemplated that each dental officer embarking with his organization for overseas duty take with him a complete portable outfit, whose several chests were filled with six months' supply.² Theoretically this arrangement was eminently satisfactory, and proved to be so in the early months of the war before the overseas transportation became congested. Later, dental equipment was placed aboard ship with all the other elements of the cargo which were unloaded en masse at the base ports in France. Here the dental equipments were lost in the overcrowded warehouses or at the large supply dumps adjacent thereto.²

In the effort to remedy this situation, a cablegram was sent to the Surgeon General recommending that previous instructions on this matter be so modified as to direct each dental officer to carry his portable outfit as baggage, for which he would be personally responsible both on shipboard and after arrival in France.² This plan was carried out more or less satisfactorily and was insisted upon as the only possible method that would insure the dental officer having his equipment in his possession on arrival.² But in maintaining this plan the dental service ran counter to that general instruction to port commanders which directed that equipment be unloaded from ships and placed in a pool, to be subsequently claimed if possible, and if not, replaced through emergency requisition on supply depots.²

In accordance with previously arranged plans of organization, competent dental officers were assigned to duty at the important supply depots, the first officers thus assigned reporting at the depot at Cosnes on September 1, 1917.²

His duties were later extended to include purchase of dental equipment and supplies through the medical member, general purchasing board. On March 1, 1918, a dental officer was assigned to the advanced medical supply depot, Is-sur-Tille.² On account of the great amount of dental supplies received at medical supply depot No. 1, base section No. 1, in the earlier months of 1918, a dental officer was placed there on duty as assistant to the medical supply officer, where he remained until June, 1919.² In 1918 one or two more dental officers were detailed to serve with the other large supply depots. These officers remained for short periods on temporary duty.² In the late autumn of 1918 a dental officer was sent to the Gievres depot for temporary duty to develop certain articles of field equipment.² No dental officers were permanently assigned to supply duty at the base ports other than at St. Nazeire (base section No. 1), but the supervising dental surgeons in the base sections were available to render counsel concerning dental equipment.²

Actual field experience in combat divisions early demonstrated the fact that the old pre-war portable dental outfits were not practicable for active field service. The bulk and weight of the several containers seriously handicapped their transportation with mobile units. After careful study the following conclusions were reached concerning the field dental equipment:² The full portable outfits were to be retained for use at camp hospitals and at such other detached organizations of the Services of Supply as could readily furnish transportation for them. Modified portable outfits packed in three chests were provided for combat divisions.² These consisted of the essential equipment of medicines and of a small stock of supplies which were considered sufficient for the practice of field dentistry.²

An even more reduced outfit, termed "campaign equipment," was provided for the use of dental officers with divisions in battle areas.² This consisted of a dental engine chest and its normal contents, plus the contents of the emergency dental kit. This kit was designated personal dental equipment and was to be carried by each officer at all times while in the combat area. It comprised a few essential instruments and medicines in cloth rolls and a very small amount of supplies, all contained in Hospital Corps pouches carried over the shoulder by the dental officers and their assistants.² Thus officers were enabled to render first-aid dentistry at all times for the relief of pain and for minor oral surgical or dental operations. This modification of dental equipment helped solve many of the transportation problems for the dental service in combat divisions, and while it increased the weight carried by dental officers, it proved advantageous by making it possible for anyone requiring emergency dental service to obtain it at any time from the dental officer of his command.²

In combat divisions, the transportation of dental equipment and supplies was always a problem and when not carried individually, a source of irritation to division commanders, transportation officers, and division surgeons.² This was largely due to the fact that no provisions had ever been made in the Tables of Organization for dental personnel, commissioned and enlisted, or for dental equipment. Omission in these tables of the Dental Corps and of provision for transport of its supplies resulted in the loss of much equipment and the consequent temporary lack of dental service in several of the divisions.² The

1st Division on its movement into a combat area in May, 1918, found it expedient to abandon all its dental equipment on account of the lack of transportation, for this material had not been considered by its transportation officer in making his allowances for the rapid movement of equipment and supplies.² This loss was immediately investigated and efforts were made for finding and salvaging the abandoned equipment. Though not found at the time it was subsequently redeemed through the salvage service.² In the interim, through efforts made at intermediate medical supply depot No. 3, the dental service of the division was reequipped with modified portable outfits. As a result of the information obtained by the chief dental surgeon, who was sent to investigate the matter, the dental service, both personnel and equipment, was for the first time provided for in division tables of organization.² Instructions on the subject were published in General Orders, No. 99, G. H. Q., A. E. F., June 19, 1918, which provided for a divisional dental service comprising 31 officers and 32 enlisted men, with 10 portable dental outfits, 20 modified portable outfits and 1 portable laboratory. The total weight of this equipment was 12,000 pounds and its bulk 574 cubic feet.²

A portable dental laboratory was also adopted to meet the prosthetic requirements of a division.² All essential equipment for this was packed in one dental supply chest, which weighed approximately 200 pounds.

When the several army corps were organized provision was made for supply parks at or near the headquarters of each, except for the Second Army Corps, which was operating under the British.² In accordance with the Abbeville agreement replacement supplies were to be furnished by the British Army for the troops composing divisions of that corps. Therefore, the American Expeditionary Forces were not directly concerned in its replacement supplies until the late fall of 1918, when the corps reverted to American control.² The initial dental equipment and supply for the troops in that corps would have been amply sufficient to carry them through their campaign under British control, had it not been that all their equipment was reduced to a minimum and excess supplies abandoned immediately prior to their entry into the combat zone. Each division was directed to organize supply dumps in its area for replacement purposes.² The corps parks and division dumps were fed from the advanced medical supply depot, Is-sur-Tille, as were also the army supply depots at the time of the organization of the First Army, August 12, 1918.²

Great difficulty was experienced in procuring the necessary special equipment for maxillofacial surgery and for the prosthetic and reconstruction procedures required in the practice of that specialty.² Adequate consideration and study had been given this subject prior to the departure from the United States of specialists in this line, and provision had been made whereby special chests containing maxillofacial unit equipment would be shipped immediately on their departure.² These plans failed and the much needed special equipment for this service was not received until after the signing of the armistice. It was found subsequently in the midst of a quantity of supplies at the port of Marseille.² Loss of this equipment necessitated the purchase of all articles of this type that could be found in France and the manufacture of such parts of it as were not found in that market.² The British and French afforded the

benefit of their experience in the treatment of face and jaw wounds and this greatly appreciated assistance helped materially in procuring much of this special equipment through purchase and manufacture.² Though this equipment was not available on many occasions when it was needed by the dental officers at evacuation hospitals, mobile hospitals and at some few base hospitals, the deficiency was well met by individual ingenuity and by improvisation.²

Generally speaking, the system of dental supply through operation of the automatic table was satisfactory, this being especially true in regard to field equipment.² Theoretically, the automatic table met the situation in an admirable manner, and had ocean, rail, and storage facilities permitted its movement according to the priority schedule, no shortage or delayed replacement or replenishment would have occurred.² As it actually worked out, the lack of laboratory equipment and supplies was embarrassing on several occasions and there was a long period extending over several months when the shipment of greatly needed base outfits, including electrical equipment, was withheld.² Consequently projects for installation of this type of equipment in all base hospitals and major clinics were delayed. A large consignment of this class of equipment and supplies arrived in November, 1918, and was thus available for the several hospitals and the many large clinics then being established in base sections, embarkation camps and army areas.² In these places efforts were being made to render complete dental service for the troops who had been temporarily deprived of it, through the exigencies of an active campaign.²

The following special appliances were developed in the American Expeditionary Forces to meet the requirements of its dental service:²

AMEX DENTURE

A denture cast in aluminum of one piece, wherein the base plate and the teeth themselves were reproduced in this light, inexpensive metal. This process of plate construction lent itself admirably to the military service, inasmuch as more than 98 per cent of the dentures required were for partial loss of teeth. For full dentures, well-matched porcelain incisors and cuspids were attached thereto solely for esthetic purposes. These appliances materially reduced the expense of dentures, the supply stock, and necessary equipment.²

AMEX CASQUE

A surgical appliance for face and jaw reconstruction; the further development of a similar article used in the surgical services of the British and French Armies. It consisted of an adjustable steel band, fitting around the circumference of the head, with adjustable cranial bands and an adjustable perpendicular rod and horizontal face bow. Its use in facial and jaw reconstruction permitted of absolute fixation for either soft parts or osseous fragments, and it was of great value in this class of highly specialized surgery.²

EMERGENCY KITS

These consisted of two Hospital Corps pouches to be slung from the shoulder, one for the dental officer and one for his enlisted assistant.² They contained the essential instruments and medicines, secured in cloth rolls, and sup-

plies for administering first-aid dentistry and for the simpler operations of field dentistry. They were prescribed articles of personal equipment for dental officers and were ordered carried whenever combat organizations entered the combat area. Through them it became possible for the troops to receive emergency dental treatment for the relief of pain without leaving their commands.²

FOLDING TRENCH CHAIR

This article of equipment was developed for the purpose of supplying a seat, with stabilized head rest, in order that dental services might be rendered conveniently in trenches, dugouts, and advanced dressing stations.² It was made of aluminum, reinforced by steel rods and was capable of being folded and carried in a musette bag with the two pouches of the emergency kit. It weighed, complete $4\frac{1}{2}$ pounds.²

DENTAL AMBULANCES

The difficulties of supplying dental care to troops at outlying stations emphasized the great need for dental ambulances, which when fully equipped as "mobile dental clinics" would be capable of traveling under their own power from station to station.² Plans were made to have such mobile dental clinics; further, it was planned that they would remain at each station a sufficient number of days to permit of the emergency dental treatment of the command. Eleven such vehicles voluntarily contributed in America, and only requiring transportation overseas, unfortunately remained at a home port of embarkation for many months through lack of shipping facilities. Several communications urging their transportation were made by cable and letter to the United States, but these were fruitless.²

Two dental ambulances were, however, presented in France to the dental service, A. E. F.² One, donated conjointly by two American dentists, had come originally from American Red Cross hospital at Neuilly. It was thoroughly overhauled, equipped, and put in charge of a dental officer November 1, 1917, being designated dental ambulance No. 1, A. E. F.² Assigned to the motor transport division, Mailly, then located back of the line to the southeast of Soissons, this vehicle continued to operate during the entire period of activities, its station assignment being with one or another of the several units of the motor transport corps in the vicinity of Mailly. The second ambulance was presented to the dental service by the American Red Cross, through its medical director in Paris.² This ambulance was delivered at headquarters, Chaumont, about March 1, 1918, and was immediately placed in charge of a dental officer and designated dental ambulance No. 2.² Its station assignment was with the Air Service of the advance section, with headquarters near Colombe la Belle, and its first location at the second bombardment airdrome.² Throughout the entire subsequent period of activities this vehicle rendered service to the several small detached stations adjacent to the headquarters, Air Service.²

INSPECTION

It was early realized that the best service could be obtained only through providing direct supervision and inspection of dental work by qualified dental inspectors.² Instructions therefore were issued requiring that each dental sur-

geon in an administrative position make regular and systematic inspections of the dental officers attached to the command.² These inspections were to consider personnel, both commissioned and enlisted, discipline and efficiency, character of service, etc. Reports of inspections were forwarded through medical channels to the office of the chief surgeon, A. E. F. In addition to these inspections, it was found necessary at first for the chief dental surgeon to make frequent visits to the headquarters of each division in the American training area. There he inspected the office records, and the methods of the division dental surgeon, as well as the headquarters dental clinic.² At the same time he gave instructions to remedy defects or to effect a development of the service. As these inspections by the chief dental surgeon were later extended to include base hospitals, he visited during the first six months of the American Expeditionary Forces, base hospitals Nos. 15, 18, 21, 23, 31, 32, 36, and American Red Cross Hospital No. 1, Neuilly. His personal inspections in training areas were made regularly until March, 1918, when the chief surgeon's office was moved from general headquarters, Chaumont, to the headquarters of the Services of Supply at Tours.²

SERVICE RENDERED

The character of the dental service in the American Expeditionary Forces differed considerably in different zones and from time to time, depending on resources and campaign activities.² When the combat divisions were in training areas it was possible to conduct a high-class tooth-conservation service, with a view of rendering all men dentally fit for the period of the campaign.² Therefore, consistent efforts were made then to survey and record oral and dental conditions for the entire personnel of organizations. These records were carefully studied so as to give priority for cases requiring oral prophylaxis as a health measure; i. e., for extraction of broken-down teeth and roots, evacuation of abscesses, and removal of rough calcareous deposits.² This was followed later by such filling operations for tooth conservation and masticatory restoration as were deemed practicable.² Later, when divisions entered combat areas, and when dental outfits were reduced to combat equipment it was impossible to give more than emergency treatment for the relief of pain, and dental service was necessarily of a simpler character.² On the march, and during actual engagements, as already mentioned, dental officers and enlisted assistants carried emergency kits, for the sole purpose of rendering immediate treatment, which mainly consisted of extraction, minor surgical operations, medicinal applications and sometimes plastic fillings, so that the soldier might return to the front line without loss of time.²

During the armistice, when the troops had returned to rest and billeting areas for the winter, the character of dental service again changed. More careful consideration was now given to tooth conservation, through permanent fillings, tooth restorations, and the construction of crowns, bridges, and dentures.² Every effort was made to put the teeth of the men in first-class condition, prior to their return to the United States and release from service.² The number treated for the month of March, 1919, as compared with the number treated in September, 1918, showed an approximate gain of 300 per cent in dental activities and accomplishments.² The former was a period of

rest, the latter one of active field operations. The consolidated report for February, 1919, shows that during that month 119,792 persons were treated and 183,031 dental operations performed.²

The service rendered at base hospitals was of high order at practically all times. Their superior equipment materially enhanced the performance of high-grade professional work, but during the stress of battle the dental service rendered at these units and at evacuation hospitals consisted mainly in the emergency treatment of wounded with special consideration of face and jaw cases.

The practice of dentistry was carried on very thoroughly wherever modern dental equipment, consisting of base dental outfits with electrical apparatus, high-low base chairs, white-enamel steel cabinets and complete laboratories, was installed.² Such facilities were provided at the large dental clinics organized in the base sections, Services of Supply, in embarkation areas, at hospital centers and at several important headquarters.²

The various base section dental clinics and those at replacement depot, St. Aignan, embarkation area, Le Mans, American University, Beaune, and at the central dental infirmary, district of Paris, were organized for the purpose of centralizing, standardizing, and directing dental service, for coordinating the problems of equipment and supply, and for obtaining the greatest efficiency through technical direction and by friendly competition.² From 10 to 30 operators were occupied in these large clinics; they became show places of great interest to visitors.²

Comparatively few dentures were required by the (approximately) 2,000,000 men in the American Expeditionary Forces, and those constructed were mostly partial dentures for the replacement of a few lost teeth. The full dentures required were less than 2 per cent of all dentures constructed.²

A consolidated report covering dental service rendered in the American Expeditionary Forces from July, 1917, to May, 1919, inclusive, shows that a total number of 1,396,957 persons were treated; 2,626,368 sittings were given; 497,948 treatments (medicinal) were administered; 2,013,580 operations performed (which included 1,605,424 fillings and 384,427 extractions); and the following prosthetic operations performed: 60,387 crown and bridge constructions, including repairs and resets, and 13,140 denture construction and repairs.²

In the early months of the American Expeditionary Forces, consideration was given to the selection of certain base hospitals and providing those so selected with special personnel and appliances for handling the maxillofacial cases of the American Army.² The following hospitals were tentatively chosen for this work: Base Hospital No. 18, Bazoilles; Base Hospital No. 15, Chaumont; Base Hospital No. 21, Dijon; Base Hospital No. 26, Angers; Base Hospital No. 6, Bordeaux, and Base Hospital No. 8, Savenay.² These units were held in reserve for the accumulation of cases that would require evacuation to the United States.² These plans were changed in May, 1918, upon the arrival of the above-mentioned group of 40 specialists in general and dental surgery for duty in the maxillofacial surgical service. These officers came over under direction of a medical officer who was a well known specialist in this line of surgery and who was soon designated chief consultant of maxillofacial surgery, A. E. F.²

The dental personnel of this group soon came under the administrative control of the dental division of the chief surgeon's office.² The chief surgeon decided to make temporary assignment of a medical and dental officer to each of the several important centers in England, Belgium, and France, where this work was being done, in order that they might observe and study the latest method of procedure.² They could be spared at this time because American troops had not yet largely entered into active combat, nor had the special equipment which these officers required, been received from the United States.²

Upon the return of these officers from their tours of observation, they were organized by the chief surgeon into maxillofacial teams, each composed of one surgeon and one dental surgeon, and were assigned to the important hospitals or to hospital centers.² The original plan of designating certain hospitals for maxillofacial surgery was therefore abandoned, the new arrangement providing that each important hospital center and every evacuation hospital would carry on this work.² Base Hospital No. 115, Vichy, was designated the "head hospital," and an adequate group of surgical and dental specialists was sent there to organize and develop it.²

Between 2,000 and 2,500 cases of face and jaw injuries occurred among the American wounded.² Of this number, about two-thirds treated in the hospitals in France were cured, and were returned to duty there.² About 700 cases of severe type, requiring reconstruction operations, were evacuated to the United States.² The cases selected for such evacuation were of five classes: First, compound, comminuted fractures of the jaw in process of consolidation and having splinted fixation; second, compound, comminuted fractures, with delayed union due to sequestra, presence of infected teeth or foreign bodies and requiring long-continued drainage—splinted with fixation; third, united fractures with loss of bony substance, requiring bone graft or prosthetic replacement—splinted with fixation; fourth, cases with healed scars involving either of the conditions mentioned above and requiring a series of plastic operations; fifth, cases of any of the above types, with extensive loss of soft tissue partially healed and distorted, for corrective plastic operations. The first convoy of these wounded embarked in October, 1918.²

The technique employed in the hospitals of the American Expeditionary Forces for the treatment of the injuries classed in the foregoing categories was based to a large degree upon that developed through the experience gained by the French, British, Belgian, and Italian services, for in these armies, through opportunities covering a period of four years, several men had become masters in maxillofacial surgery.²

The selective methods of making bone grafts, in cases in which appreciable loss of bony substance occurred, were of three types.² First, free graft from a rib, the tibia, or the crest of the ilium; second, osteoperiosteal grafts from the tibia; third, pedicled graft from the mandible itself, shifted into position.² Some form of splint was used in all these cases to assure fixation of fragments in normal relation.² The policy ultimately adopted for this class of cases contemplated that the simpler ones would all be cared for in the hospitals in the American Expeditionary Forces and that the severer cases, after the first stages of the work, would be evacuated to a hospital at a base port, where they would

receive the properly adjusted "open bite" splints to prepare them for the ocean voyage.² In this connection, it should be remarked that none of the "closed bite" splints could be used in these cases, for it was feared that because of seasickness they would endanger the life of the patients through subjecting them to strangulation by vomitus.²

Many types of splints were made for these cases and many names were given to the several types.² With a view of standardizing them, the following terms were finally adopted: Interdental splints were splints made for one jaw, either upper or lower. Intermaxillary splints were those made for both upper and lower jaw and connected by some mechanical method for fixation.² This latter type was made for both the "open-bite" method and the "closed-bite" method, to meet requirements, and, as many of the cases required at different times both the open- and closed-bite splint, a combination splint was devised which could be used in either circumstance.² This splint was provided with lock pins through the bicuspid region, which held the upper and lower parts firmly together as a closed bite, but when the pins were withdrawn and the jaws opened, the insertion of metal stilts to retain the open bite was feasible. These stilts were firmly held in position by the reinsertion of the lock pins.²

PERSONNEL ^a

(July 28, 1917, to July 15, 1919)

Col. Robert T. Oliver, D. C., chief.

Lieut. Col. William S. Rice, D. C.

Maj. Richard K. Thompson, D. C.

First Lieut. John D. Brown, D. C.

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- (3) Letter from The Adjutant General to the Surgeon General, June 19, 1917. Subject: Extract from cablegram (cipher cable) received at War Dept., from Page to Secretary of State, London, June 12, 1917. On file, Record Room, S. G. O. (138036).
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- (5) Par. 8, Special Orders, No. 76, general headquarters, A. E. F., August 23, 1917.
- (6) Report from Brig. Gen. Jefferson R. Kean, M. C., to the chief surgeon, A. E. F., April 24, 1919. Subject: Data to be used by military board of allied supply. Copy on file, Historical Division, S. G. O.
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- (8) Report from the chief surgeon, A. E. F., to the Surgeon General, U. S. A., May 1, 1919. Subject: Activities of the chief surgeon's office to May 1, 1919. On file, Historical Division, S. G. O.

^a In this list have been included the names of those who at one time or another were assigned to the division during the period July 28, 1917, to July 15, 1919.

There are two primary groups—the heads of the division or the section and the assistants. In each group names have been arranged alphabetically, by grades, irrespective of chronological sequence of service.

CHAPTER VII

THE NURSING SECTION; RECONSTRUCTION AIDES

THE ARMY NURSE CORPS

The few hundred nurses who formed a part of the six base hospital units assigned to service with the British Expeditionary Forces, and the other nurses who arrived in France during the early period of the American Expeditionary Forces, were for five months under the general jurisdiction of the office of the chief surgeon, A. E. F., after that office was established in June, 1917,¹ and of its personnel division after that division was created in July.² On October 2, 1917, General Pershing cabled to the War Department a request that a competent member of the Army Nurse Corps be sent to Paris to serve as superintendent of nurses of the American Expeditionary Forces.³

The chief nurse of Walter Reed Hospital was selected for this assignment and, with an assistant, reported for duty on November 14, 1917, at headquarters, line of communications (then in Paris), and on the day following was assigned as chief nurse, line of communications.¹ At the time in question, most of the nurses of the American Expeditionary Forces were on duty at base hospitals in France, and these (other than the six above mentioned) were under the administrative control of the chief surgeon, line of communications.⁴ When headquarters, line of communications, moved to Tours in January, 1918, the office of the chief nurse accompanied it as a part of the personnel division, office of the chief surgeon, line of communications.⁴ No member of the Army Nurse Corps served in the office of the chief surgeon, A. E. F., until that office moved to Tours and there absorbed the office of the chief surgeon, line of communications, in March, 1918.⁴ The office of the chief nurse then became a section of the personnel division, chief surgeon's office.⁴

On October 8, 1918, the Surgeon General notified the chief surgeon that authority had been received from the Secretary of War for the appointment of a director and two assistant directors of the nursing service in France, and for a director and two assistants for our nursing service in base section No. 3 (England).¹ No such appointments were made in base section No. 3, however, for the chief surgeon of that section decided that so many administrators for the nursing service there were unnecessary and, therefore, continued in that section the office of chief nurse which had been established there June 17, 1918.¹ The chief nurse of the American Red Cross in France, who formerly had been chief nurse of Base Hospital No. 21, was appointed director of the nursing service, A. E. F., and on November 15, 1918, reported to the chief surgeon, A. E. F., at Tours,¹ thus replacing the chief nurse, A. E. F., who left, on December 2, to become assistant to the superintendent of the Army Nurse Corps in the Surgeon General's office.¹ The chief nurse of base section No. 3 and a nurse who had been assistant to the chief nurse were appointed assistant directors of the nursing service, A. E. F., November 18 and December 14,

respectively.¹ The staff of the director of the nursing service, was further augmented by assigning to it, on January 13, 1919, a nurse from Base Hospital No. 7, who formerly had been matron of General Hospital No. 22, British Expeditionary Forces, and, on February 3, 1919, the chief nurse of Base Hospital No. 27, the duties of the last-mentioned member of this staff including both service at the central office and inspection of the nursing service in hospitals.¹

Most of the nurses who served in the American Expeditionary Forces arrived as members of base hospital units, but others came in replacement units, and were not attached to any hospital until assigned in France.¹ Others sailed as casuals (one group of these, which arrived in the summer of 1918, including 500 nurses) and a few as members of small organizations such as mobile operating units, psychiatric units, etc.; one group consisted of anesthetists.¹

On August 11, 1917, the chief surgeon, when submitting to the chief of staff, A. E. F., an estimate of the medical personnel that would be necessary for an army of 1,000,000 men, calculated that the number of nurses required for such a force would be 22,430; however, at no time did the quota of nurses approximate this estimate.⁴

In the first six months after the United States entered the war a few more than 1,100 nurses arrived, of whom about half served in the six base hospitals assigned to the British.¹ From November, 1917, until March 31, 1918, less than 900 others arrived, and there was a consequent shortage on that date of 400, even under the reduced priority schedule prescribed by the general staff, A. E. F.¹ At this time there were only 2,088 nurses in France, of whom approximately 700 were under British control.¹

The consequent shortage of nurses in the American Expeditionary Forces was due primarily to the great need for combatants and to lack of transport facilities.⁴ At times there were as many as 1,400 nurses in the mobilization station in New York, awaiting transportation, several groups being thus detained as long as three months.⁵ By the middle of April, when the shortage of Medical Department personnel had become so acute that a breakdown in its service was threatened, the shortage of nurses was estimated at 1,121.¹ On May 3 a cable was sent asking that 555 be sent immediately.¹

On June 30, 1918, nurses serving in Europe, or designated for foreign service, were distributed as follows:⁵ British forces, 755; French forces, 14; American forces, 3,323; awaiting transportation or en route to mobilization station, 1,258; total, 5,350. This number included nurses sent to the American Red Cross Military Hospitals Nos. 1, 2, and 3.⁵

Because of the increase of our combat activities in the ensuing weeks, Medical Department personnel was engaged to such an extent that on July 27, 1918, the chief surgeon reported that the resources of the Medical Department were practically exhausted in so far as personnel was concerned, and on August 10 a cable was sent from general headquarters, requesting absolute priority for medical organizations, including 2,312 nurses.¹ During that month, 1,000 nurses arrived in France.¹

Under date of September 21, the personnel division reported that the shortage of nurses continued to be acute; all hospital units were short of nurses and demands were being made by camp hospitals for large numbers of them

because of the epidemic of influenza.⁶ It was impossible, of course, to furnish all the nurses requisitioned by various organizations.⁶

When the armistice was signed there was a total of 8,587 nurses on duty overseas, the number short of actual needs being approximately 6,925;⁷ the number of patients in hospital under treatment on November 12 totaled 193,026, distributed in 153 base hospitals, 66 camp hospitals, and 12 convalescent camps.⁸ The number of nurses on duty in the hospital centers, where the largest number of patients were grouped at this time, was as follows:¹ At Mesves hospital center where patients in 10 base hospitals and in the convalescent camp numbered 20,186 on November 16, the center's peak day, there were 394 nurses.¹ At Mars hospital center, on November 16, in six hospitals and in the convalescent camps, 14,302 patients were cared for by 493 nurses.¹ At Allerey, on the 17th, in 6 hospitals and in the convalescent camp, there were 17,140 patients, cared for by 360 nurses, and at Toul on the 28th of November, in 7 hospitals there were 10,963 patients, cared for by 320 nurses.¹ The maximum number of nurses at certain centers at one time was: Mesves, 650 on January 4, 1919; Mars, 642 on December 4, 1918; Toul, 438 on February 1, 1919.¹

Between November 11, 1918, and January 25, 1919, when the greatest number of nurses was on duty in the American Expeditionary Forces, nearly 1,500 nurses arrived—more than the total number received in 1917.⁴ The greatest number of nurses reached in the American Expeditionary Forces was recorded in the week ending January 11, 1919, when their number totaled 10,081, including approximately 700 on duty with the British.⁴ This total should show as of the first week in December, for there were no arrivals subsequent to that date.⁷ At this time the strength of the American Expeditionary Forces was approximately 1,750,000 men.⁹ With the exception of casual nurses who were separated for various reasons, the first group which left France was that with Base Hospital No. 2, which sailed early in January, 1919.¹ From that time the return of nurses was gradual, averaging from January through April, 1919, about 200 nurses a week.¹ During the last week of April over 800 nurses sailed.¹ No chief nurse was appointed for any of the sections of the Services of Supply except base section No. 3.⁴

One of the important developments of the nursing service in France was the appointment of a chief nurse at some of the hospital centers.¹ This plan, which was not prescribed in orders from higher authority, developed at the several centers independently, in an informal manner in November, 1918, and was a natural result of the grouping at each center of several hospitals under a general command.¹ It developed to different degrees in the several centers and was apparently of value in every place where it was tried, except that in one or two instances the center chief nurse was unable to secure cooperation.¹ The plan was adopted at the following centers:¹ Allerey, Bazailles, Beau Desert, Mars, Mesves, Nantes, Savenay, Toul, Vichy.

Center chief nurses acted as assistants to the director of nursing service. At Mesves her duties were prescribed as follows:¹

1. To assist the commanding officer of the center in such matters pertaining to the nurses of the center as he may see fit to assign to her.

2. To assist in the distribution and readjustment of nurses within the center, according to the pressure of work in the various hospitals.

3. To keep informed by frequent visits of the conditions in the hospitals of the center, as they affect the nursing personnel such as quarters, the mess, means of recreation, care of sick nurses, etc.

4. To bring to the attention of the director of nursing service, after consultation with the commanding officer of the center, any matters which seem to need special adjustment.

5. To act as chairman of a committee of chief nurses of the center. This committee will make suggestions for regulations governing the conduct, and social relations of nurses, which shall be, as far as possible, uniform for the entire center. These suggestions should be presented to the commanding officers for their approval and indorsement. The object of this committee will be to promote the welfare of the nurses within the center, and to maintain a high standard of service and conduct within the Army Nurse Corps.

6. To act as hostess of the center. In that capacity she will meet each new chief nurse arriving at the center and see that the latter has all information that will assist her in the performance of her duties. She will also, in cooperation with the commanding officers and chief nurses of the center, endeavor to promote a wholesome social life among the nurses.

Similarly, as prescribed by regulations, a chief nurse was designated for each hospital where a group of nurses was on duty, whether mobile, evacuation or base, and whether it was part of a center or operating independently.¹

Experience showed that the nursing units definitely organized by a head nurse in civil hospitals and colleges, among women who were accustomed to work together were more quickly efficient than were those composed of casuals gathered from many sources.¹ The latter, with no previous division of assignments according to the particular qualifications of each member were inevitably handicapped at first by a lack of mutual acquaintanceship.¹

RECONSTRUCTION AIDES

The employment of reconstruction aides was an innovation during the World War, and it was not until during the armistice that any great use of them was made overseas.

A memorandum published December 31, 1917, by the Surgeon General, covering the organization under the division of military orthopedic surgery, and giving the duties, status, etc., of the "woman's auxiliary medical aides," was given application in the American Expeditionary Forces. These aides were engaged in physiotherapy work.¹⁰ Their designation was changed to "reconstruction aides," and some of the provisions for their employment were modified by the Surgeon General on January 22, 1918.¹¹

On May 3, 1918, the Surgeon General authorized the chief medical officer of each army or separate auxiliary force¹² to appoint head aides, not to exceed two to each hospital, from among the reconstruction aides serving overseas.

On May 21, 1918, the chief surgeon, A. E. F., initiated a cabled requisition for 30 reconstruction aides for service in overseas orthopedic hospitals.¹³ This request received a favorable reply,¹⁴ but several months elapsed before they began arrive in numbers. This led the senior consultants to try and secure them through the American Red Cross. On July 13, the director of professional services was notified that the senior consultants of special services should look far enough ahead to prevent the employment of aides from the Red Cross, thus necessitating that organization cabling to the United States for replacements.¹⁵

Requirements for reconstruction aides who were engaged in occupational therapy work, were outlined in a circular published by the Surgeon General, August 8, 1918.¹⁶

Early in August a request was cabled that 20 reconstruction aides be sent over with each base hospital, half of them to be trained in physiotherapy and half in occupational therapy.¹⁷ These aides were to be carried as civilian employees and not included in the reports and returns of nurses.¹⁸ Toward the end of that month the senior consultant in orthopedic surgery was notified that the Surgeon General was organizing reconstruction aides in groups of 20 members each and that these groups would be sent as fast as possible to the American Expeditionary Forces, as enumerated units, for further reassignment there.¹⁹ A reconstruction aide unit arrived at Havre, October 19.²⁰ Certain aides had arrived before that date¹⁸ but from that time forward their numbers increased considerably. Upon arrival they were assigned to hospitals and hospital centers.

The supervisor of reconstruction aides was at first located at Savenay²¹ but in January, 1919, joined the chief surgeon's office at Tours.¹ All occupational therapy aides for overseas service were versed in simple bedside handicrafts.²²

The reconstruction aides were under the direct supervision of the director, nursing service, their function being to carry out instructions in the rehabilitation of wounded in methods of physical and occupational therapy.^a When practicable they were quartered at the hospitals and were entitled to rations, to the laundering of uniforms, to transportation; also they were entitled to \$4 per day when traveling. They were authorized to purchase Quartermaster Department supplies on written approval of the commanding officer, but were not entitled to heat and light.²³ The reconstruction aides had the same pay as nurses, and increase of pay was applied to them as well.²⁴

On December 29, 1918, there were 200 reconstruction aides serving in the American Expeditionary Forces, distributed among 20 base hospitals.²⁵ By March 15, 1919, this number had been reduced to 93, of whom 71 were engaged in physical therapy and 22 in occupational therapy.²⁶ These aides were then attached to 10 hospitals distributed among 6 hospital centers.²⁶ On May 1, 1919, there were 109 aides in the Services of Supply (55 occupational, 54 physiotherapy) distributed among 14 hospitals. Thirty other reconstruction aides were at that time on duty with the Third Army in Germany.²⁷

On June 18, 1919, the chief surgeon, Third Army, was notified that reconstruction aides were not now considered civilian employees and that they were to be returned to the United States before June 30.²⁸

^a See Circular No. 56, chief surgeon's office, Nov. 19, 1918, quoted in the appendix.

PERSONNEL^a

(July 28, 1917, to July 15, 1919)

ARMY NURSE CORPS

Bessie S. Bell, chief nurse, A. N. C.

Julia C. Stimson, director, nursing service.

Nina E. Shelton, assistant director, nursing service.

Blanche S. Roulon, chief nurse.

Arma E. Coffee, assistant chief nurse.

Marion G. Parsons, nurse.

SUPERVISOR, RECONSTRUCTION AIDES

Marguerite Sanderson.

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- (2) Memorandum from the chief surgeon, A. E. F., to the chief of staff, A. E. F., July 28, 1917. Subject: Weekly war diary. On file, Historical Division, S. G. O.
- (3) Cable No. 197, par. 3, from Gen. John J. Pershing, to The Adjutant General, October 2, 1917.
- (4) Report from the chief surgeon, A. E. F., to the Surgeon General, U. S. Army, May 1, 1919. Subject: Activities of the chief surgeon's office to May 1, 1919. On file, Historical Division, S. G. O.
- (5) Annual Report of the Surgeon General, U. S. Army, 1918, 429.
- (6) Weekly war diary, chief surgeon's office, A. E. F., September 21, 1918.
- (7) Report from the chief surgeon, A. E. F., to the commanding general, A. E. F., April 17, 1919. Subject: The Medical Department, A. E. F., to November 11, 1918. On file, Historical Division, S. G. O.
- (8) Final report of Gen. John J. Pershing, September 1, 1919, 77.
- (9) Report of "Strength of the A. E. F. by months as shown by the consolidated returns for the A. E. F.," January 12, 1924. On file, A. G. O., Returns Section, Miscellaneous Division.
- (10) "Circular of information concerning the woman's auxiliary medical aides," the Surgeon General's Office, December 31, 1917. On file, Historical Division, S. G. O.
- (11) "Circular of information concerning the employment of reconstruction aides, Medical Department, U. S. Army," the Surgeon General's Office, January 22, 1918. On file, Historical Division, S. G. O.
- (12) Memorandum from the Surgeon General of the Army to the Supply Division, S. G. O., May 3, 1918. Subject: Approval of letter of appointment for reconstruction aides. On file, Historical Division, S. G. O.
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- (14) Cable No. 1434-R, par. 4, from The Adjutant General of the Army, June 3, 1918, to General Pershing. On file, A. G. O., World War Division, chief surgeon's files, (231.238).

^a In this list have been included the names of those who at one time or another were assigned to the division during the period July 28, 1917, to July 15, 1919.

There are two primary groups—the heads of the division or the section and the assistants. In each group names have been arranged alphabetically, by grades, irrespective of chronological sequence of service.

- (15) Third indorsement from the chief surgeon, A. E. F., to director of professional services, A. E. F., July 13, 1918; on letter from the senior consultant, orthopedic surgery, A. E. F., to the chief surgeon, A. E. F., July 11, 1918. Subject: Reconstruction aides. On file, A. G. O., World War Division, chief surgeon's files (231.238).
- (16) Circular, "Reconstruction aides in occupational therapy," Office of the Surgeon General, August 8, 1918. On file, Historical Division, S. G. O.
- (17) Cable No. 1546-S, par. 9, from General Pershing to The Adjutant General of the Army, August 2, 1918.
- (18) First indorsement from the chief surgeon, A. E. F., to the commanding officer of Base Hospital No. 9, August 6, 1918; on letter from the commanding officer, Base Hospital No. 9, A. E. F., to the chief surgeon, A. E. F., August 2, 1918. Subject: Reconstruction aides. On file, A. G. O., World War Division, chief surgeon's files (231.238).
- (19) Letter from the chief surgeon, A. E. F., to senior consultant in orthopedics, August 28, 1918. Subject: Reconstruction aides. On file, A. G. O., World War Division, chief surgeon's files (231.238).
- (20) Telegram from senior consultant in orthopedic surgery, A. E. F., to the chief surgeon, A. E. F., October 15, 1918. On file, A. G. O., World War Division, chief surgeon's files (231.238).
- (21) Memorandum from the commanding general, A. E. F., to the chief surgeon, A. E. F., November 4, 1918. Subject: Contract and oath of office taken by reconstruction aides. On file, A. G. O., World War Division, chief surgeon's files (231.238).
- (22) Cable No. 267-R, par. 3, from The Adjutant General of the Army, to General Pershing, November 14, 1918. On file, A. G. O., World War Division, chief surgeon's files (231.238).
- (23) Second indorsement, from the chief surgeon's office to the commanding officer, Base Hospital No. 94, U. S. A. P. O., 713-A, France, January 30, 1919; on letter from the personnel officer, Base Hospital No. 94, to the chief surgeon, A. E. F., January 30, 1919. Subject: Pay of reconstruction aides. On file, A. G. O., World War Division, chief surgeon's files (231.238).
- (24) Telegram from the chief surgeon, A. E. F., to the chief surgeon of the advance section, A. E. F., December 21, 1918. On file, A. G. O., World War Division, chief surgeon's files (248).
- (25) Report from Marguerite Sanderson, supervisor of reconstruction aides, A. E. F., to the chief surgeon, A. E. F., December 29, 1918. On file, Historical Division, S. G. O.
- (26) Report from Marguerite Sanderson, supervisor of reconstruction aides, A. E. F., to the chief surgeon, A. E. F., March 15, 1919. On file, Historical Division, S. G. O.
- (27) Report from Marguerite Sanderson, supervisor of reconstruction aides, A. E. F., to the chief surgeon, A. E. F., May 1, 1919. On file, Historical Division, S. G. O.
- (28) Telegram from the chief surgeon, A. E. F., to the chief surgeon of the Third Army, June 18, 1919. On file, A. G. O., World War Division, chief surgeon's files (230.366).

On March 6, 1918, the chief surgeon prescribed that the division of sanitation be organized into the following sections:² (1) Sick and wounded records; (2) laboratories and infectious diseases; (3) inspection; (4) epidemiology. Though the last-mentioned section was established while the chief surgeon's office was yet at Chaumont—that is, during the early part of March—this outlined organization was not effected immediately.² On March 31, the division of sanitation was redesignated the division of sanitation, sanitary inspection, and sanitary statistics, with duties more clearly defined and established than they had been during the formative stage of its activities.⁴ On May 5, 1918, the laboratory service was separated from the other professional services⁵ with which it formerly had been operating under the division of hospitalization, to become a part of the division of sanitation, though formal orders concerning this transfer, and the reorganization of the section of laboratories and infectious diseases as a part of the division of sanitation, were not published until July 20, 1918.⁶

The organization outlined above was retained until December 26, 1918, when, as previously stated, the division of urology was transferred to the division of sanitation from that of the professional services.²

ADMINISTRATIVE FUNCTIONS

In view of the organization described above, the administrative functions which were included within the jurisdiction of the division of sanitation and inspection may be classified as follows:²

- (a) The receipt, record, and analysis of reports of disease and injury.
- (b) The receipt and review of monthly and special sanitary reports.
- (c) The selection, supply, and direction of laboratory services for the prevention, diagnosis, and treatment of disease, for the protection of water and food supplies, and for research by experimental laboratory methods in all matters pertaining to personal hygiene, physiology, the science of nutrition, pathology, and bacteriology, as they bore upon the problems of the armies.
- (d) Inspection of areas and premises occupied by the troops together with such examination of men, singly, or in groups, as was required in tracing the origin, distribution, and spread of causes of noneffectiveness, whether due to communicable disease or to other cause.
- (e) Correlation of the reports of disease with the reports of sanitary conditions, troop movements, weather conditions, military operations, or other essential factors, to the end that epidemics might be brought to an end promptly and their recurrence prevented.
- (f) Collection of data for statistical purposes to serve as a basis for the direction of sanitary policies during the present emergency, and for the service of students and administrators in the future.
- (g) The selection, training, and appointment of qualified officers and enlisted men to serve the functions above described.
- (h) Collection and publication of information dealing with preventive medicine.
- (i) Maintenance of liaison with other divisions of the Medical Department.
- (j) Maintenance of liaison with the medical services, both civilian and military, of our Allies, and with conditions of disease among our enemies, which might affect the health of our troops.

OFFICE CONTROL

Cummunications between the division of sanitation and inspection and other divisions of the Medical Department passed through the office of the chief of the division. All but routine reports were submitted direct to the chief of the division.²

By central control of correspondence and of reports concerning personnel and supplies, at the offices of the chief of the division, and of the director of laboratories, provision was made and responsibility placed, for all actions taken.²

MEETINGS AND LIAISON

Meetings of the heads of the subdivisions at the office of the sanitation division, at Tours, or at the central Medical Department laboratory, at Dijon, provided frequent opportunity for the discussions of new problems and agreement upon policies affecting the division of sanitation.² Through the deputy of the chief surgeon, at General Headquarters, the chief of the division of sanitation was kept constantly informed of the changing problems of the general staff.² Through the surgeons of armies, or of the administrative sections of the Services of Supply, he was kept in touch with the needs of combat troops and of organizations in the Services of Supply, from the moment of their arrival at the ports of debarkation, to arrival at their station in the Services of Supply, or at the front.² Officers,—e. g., sanitary inspectors and laboratory experts—charged with duties pertaining to the sanitary services, were assigned to the larger organizations of combat troops, to sections of the Services of Supply, to hospital centers, training areas, and other large commands.⁷ When the size of an organization did not justify the assignment of an officer to such service exclusively, one was charged with sanitary services of the command in addition to his other duties.⁷ Officers charged with sanitary duties thus served all commands from the largest to the smallest, and through these agencies, by successive echelons of responsibility, the sanitation division exercised appropriate supervision in its specialty over all elements of the American Expeditionary Forces.⁷

Close contact existed between the divisions of sanitation and hospitalization, particularly in matters pertaining to infectious diseases.⁷ These included the venereal diseases, after the subsection charged with that specialty was transferred to the division of sanitation as described above. The laboratory division was in especially close liaison with the professional services.⁷

The location of the headquarters of the division of laboratories and infectious diseases at Dijon, while the office of the chief surgeon was located at Chaumont, and then at Tours, caused at times, especially after the chief surgeon's office moved to Tours, delay and inconvenience to the office of sick and wounded and that of epidemiology, but difficulties in communication were reduced to a minimum by the almost daily telephonic and telegraphic communication, exchange of reports, and the frequent conferences held by the heads of the subdivision.²

The sanitation division also maintained close contact, in matters pertaining to bathing and disinfestation, with the Quartermaster Department,² and through its laboratory division with the laboratories of the Chemical Warfare Service.⁸

The division also maintained contact with the French civil and military services, in matters pertaining to sanitation and epidemiology, through the medical officers of the French military missions at general headquarters and at headquarters, Services of Supply, and through the French medical officers in each of the French regions in which American troops were stationed, or through which they passed.⁹

PERSONNEL ^a

(July 28, 1917, to July 15, 1919)

Brig. Gen. Walter D. McCaw, M. C., chief.

Col. Percy M. Ashburn, M. C., chief.

Col. Daniel W. Harmon, M. C., chief.

Col. Henry A. Shaw, M. C., chief.

Col. Haven Emerson, M. C.

Col. Henry C. Fisher, M. C.

Col. Daniel W. Harmon, M. C.

Col. Paul C. Hutton, M. C.

Col. Howard H. Johnson, M. C.

Col. James C. Magee, M. C.

Col. Robert U. Patterson, M. C.

Col. George Walker, M. C.

Col. Linsley R. Williams, M. C.

Maj. George Blackburne, M. C.

Maj. Robert H. Delafield, San. Corps.

Maj. John S. C. Fielden, jr., M. C.

Maj. Bascom Johnson, San. Corps.

Maj. Frank A. Ross, San. Corps.

Capt. George J. Anderson, San. Corps.

Capt. T. L. Harrington, M. C.

First Lieut. Howard H. Antles, San. Corps.

First Lieut. Arthur B. Crean, San. Corps.

First Lieut. Arthur E. Nelson, San. Corps.

First Lieut. Dennison Walcott, San. Corps.

REFERENCES

- (1) Report from Lieut. Col. J. F. Siler, M. C., director of laboratories and infectious diseases, A. E. F., to the chief surgeon, A. E. F. (undated). Subject: Activities of the division of laboratories and infectious diseases, from August, 1917, to July, 1919. On file, Historical Division, S. G. O.
- (2) Report of the division of sanitation and inspection, Medical Department, A. E. F., May 31, 1919, by Col. Haven Emerson, M. C. On file, Historical Division, S. G. O.
- (3) Report from the chief surgeon, A. E. F., to the commanding general, Headquarters, A. E. F., April 17, 1919. Subject: The Medical Department, A. E. F., to November 11, 1918. On file, Historical Division, S. G. O.
- (4) Memorandum from the chief surgeon, A. E. F., to the chief of staff, A. E. F., April 1, 1918. Subject: War diary for week ending March 31, 1918. On file, Historical Division, S. G. O.
- (5) Circular No. 25, chief surgeon's office, A. E. F., May 5, 1918. On file, Historical Division, S. G. O.
- (6) Circular No. 40, chief surgeon's office, A. E. F., July 20, 1918. On file, Historical Division, S. G. O.
- (7) Report on "Sanitary reports, monthly and special," October 7, 1921, by Col. Haven Emerson, M. C. On file, Historical Division, S. G. O.
- (8) Report from the chief surgeon, A. E. F., to the Surgeon General, U. S. Army, May 1, 1919. Subject: Activities of the chief surgeon's office, A. E. F., to May 1, 1919. On file, Historical Division, S. G. O.
- (9) Letter from the chief surgeon, A. E. F., to Sous-Secrétaire d'Etat du Service de Santé, section Franco-Américaine French mission, G. H. Q., A. E. F., March 8, 1919. Subject: Epidemic diseases in the A. E. F. On file, A. G. O., World War Division, chief surgeon's files, 710.

^a In this list have been included the names of those who at one time or another were assigned to the division during the period July 28, 1917, to July 15, 1919.

There are two primary groups—the heads of the division or the section and the assistants. In each group names have been arranged alphabetically, by grades, irrespective of chronological sequence of service.

CHAPTER IX

THE DIVISION OF LABORATORIES AND INFECTIOUS DISEASES

GENERAL ORGANIZATION

When the United States entered the war, practically no information was available to us relative to the laboratory organization and activities of the nations engaged. Therefore, it was not possible for the Medical Department to formulate at that time any definite plan of organization based on their experience; however, as a preliminary measure to the provision of a laboratory service for the American Expeditionary Forces, the officers in charge of the laboratory division, Surgeon General's office, assembled the personnel for an initial laboratory and dispatched it to France.¹ This unit which sailed on July 26, 1917, and arrived in France on August 5, consisted of five officers and six enlisted men under command of a major of the Medical Corps. Designated as Army Laboratory No. 1, it was assigned to station at Neufchateau about 35 miles north of Chaumont.¹ As the officer in charge of the laboratory division, Surgeon General's office, had believed that general laboratory supplies would be available in France, this unit brought with it only a few special items and procured from the Pasteur Institute in Paris an emergency equipment consisting of one French Army model field laboratory packed in chests.¹ This equipment provided very limited material for clinical pathology and general bacteriology, and only with the greatest difficulty was a very incomplete equipment for neurologic and pathologic work procured.¹ A small requisition had been placed with the supply division of the Surgeon General's office before this unit left the United States, but much of this never reached the laboratory in France.¹ A requisition was placed for the limited number of items of laboratory equipment on the Medical Department supply table, and provision was made for the supply of a standard cantonment laboratory to corps laboratories, and the Army standard field laboratory equipment (plus a poison detection chest) to mobile laboratory units, as they were ordered overseas.¹ Army Laboratory No. 1 was obliged to occupy a building altogether unsuitable for its purposes, where necessary alterations were made under almost insurmountable difficulties. Neither gas nor electricity was available with sufficient constancy to permit their use.¹

The commanding officer of this unit, who was also the adviser of the chief surgeon, A. E. F., in all matters pertaining to laboratory service,¹ formulated a tentative plan for the laboratory organizations of the American Expeditionary Forces, which was submitted to the Surgeon General in the following letter:²

1. This letter * * * is intended to furnish your office with an approximate idea of the officers, men, and supplies needed in France for the laboratory work of an army on the basis of five corps of six divisions each—a total of approximately 1,000,000 men.

PERSONNEL

(a) It is planned to establish one army laboratory with a personnel of 8 officers and 16 men, which will be the central laboratory, fully equipped for all kinds of routine special work, including research. The laboratory detachment and supplies brought over by Major Nichols will serve as the nucleus for this laboratory.

(b) This office has recommended the establishment of five corps laboratories with a personnel of 4 officers and 8 men each. These laboratories will be stationary and will need to have an equipment less complete than that of the central army laboratory, but sufficient for all routine work. They may be specialized under direction of the army laboratory, if the routine work of the corps permits.

(c) A field laboratory with two officers and four men each will be provided and attached to each division. The field laboratory will be mobile and its principal work will be the bacteriological and chemical examination of water, the taking of cultures and specimens for examination in the corps or army laboratory, the examination of smears, etc. The field laboratories will depend upon and look to the corps and army laboratories for supplies and supervision of technique, etc.

(d) *Summary of personnel—*

	Number	Officers	Men
Army laboratory (8 officers, 16 men).....	1	8	16
Corps laboratories (4 officers, 8 men).....	5	20	40
Field laboratories (2 officers, 4 men).....	30	60	120
Total.....		88	176

(e) *Chemist.*—It is planned to include in the work of the organization given above, all chemical work which is of great importance in this war and which in the English and French services is done by separate organizations. It is believed that all laboratory work can be combined to advantage in our service. For this work officers and men, chemists of the Sanitary Corps, can be used as follows:

	Number	Officers	Men
Army laboratory.....	1	2	4
Corps laboratories.....	5	5	10
Field laboratories.....	30	30	30
Total.....		37	44

SUPPLIES

(a) The supplies for the army laboratory have already been partly arranged for by a requisition prepared by Major Nichols and submitted before his departure from the United States. Further requisitions will be made on Washington for this laboratory later.

(b) At present, as our own laboratory supplies will not be available for issue for some time, work will be started near the established training camp with a laboratory outfit which has been obtained by purchase from the Pasteur Institute. Emergency items, as they may be needed, will be obtained here by purchase from the Pasteur Institute or elsewhere.

(c) It is desired that the equipment of the corps laboratories shall be the same as that already adopted for the cantonment laboratories in the United States. It is believed that the simplest method of requisition is to ask for five of these outfits.

(d) The standard field laboratory equipment can be used for the field laboratories with the addition of a chest for the detection of mineral poisons. It might be possible to obtain these here, but it is preferable to have them sent from the United States. It is planned to purchase here two motor laboratories, similar to those used in the English service, * * * for trial; but it is believed that our field laboratory can be used without a special car by transporting it on a light truck or ambulance.

(e) Laboratory supplies to replace those expended will be asked for by the medical supply officer from time to time according to strength as authorized by the supply table.

2. To recapitulate: For the whole laboratory organization there will be required about 50 medical officers and 130 men capable of doing routine laboratory work, and 35 officers and 45 men of the Sanitary Corps capable of doing chemical work. These should

be sent to France so that the required personnel for each division field laboratory will accompany each division. The army laboratory, Major Nichols in charge, will do the work of the corps laboratories until the latter can be established. There is immediate need for two chemists to start their part of the central army laboratory organization.

(a) Advance notice of all arrivals should be sent, to facilitate the assignment of laboratory personnel.

3. In regard to supplies, there will be needed 30 more field laboratories each with a small, suitable chemical chest for qualitative analysis for mineral poisons, to be provided in the United States.

(a) The question of the transportation of field laboratories will be made the subject of a later communication.

(b) There will be required five corps laboratory equipments similar to those now used in the cantonments established in the United States.

(c) Additional equipment which will be required for the army laboratory will be covered by requisitions from France from time to time.

4. Résumé:

(a) Required at once: 2 chemists, Sanitary Corps.

(b) Required with each new division which may come to France: 2 officers (1 a chemist), 4 men (1 a chemist), 1 field laboratory equipment, to which there must be added 1 chest, chemical (for the detection of mineral poisons, etc.).

(c) Required before November 15, 1917: 1 cantonment laboratory (4 others to follow before January 15, 1918).

(d) The personnel for corps laboratories should be sent from time to time as indicated by the divisions which are dispatched.

5. For the purpose of supply it is requested that this letter be taken as a requisition.

This letter indicates, among other things, that the chief surgeon's office desired three special types of laboratories not previously authorized in War Department Tables of Organization. A representative of one of these types, an army laboratory, was already provided, so far as nomenclature was concerned, in army laboratory No. 1, but in addition to its other services this unit operated as the headquarters laboratory for the entire American Expeditionary Forces until the central medical department laboratory was established at Dijon, January 1, 1918.¹ Thereafter in addition to serving the troops in the combat zone, it also served the advance section.¹ A second type of unit desired was the corps laboratory, to be organized and dispatched to France in the proportion of one for each corps.¹ The plans accepted at this time provided that each of these units should be of a stationary character, and well equipped for the service of corps troops, but events proved that their employment as contemplated was not practicable.¹ Therefore, on arrival, the corps laboratories were diverted from their original purpose and operated as base laboratories in the different sections of the Services of Supply. The third type of special laboratory desired was the field or divisional laboratory unit, one of which was to be provided for each division. These units were to be supplied with the standard field laboratory equipment already authorized by the Medical Department. As the situation later developed, these divisional units were retained in the final plan of organization, but their equipment was changed.¹

In addition to the special types of laboratories mentioned above, Tables of Organization already provided for a laboratory as a part of each base hospital and specified its personnel and equipment.³ Though none of the corps or divisional laboratories reached France before November 1, 1917, several base hospital laboratories (Nos. 6, 101, 15, 18, 17, 8, 9, and 27) arrived and began

operating.³ These base hospital laboratories had fairly complete equipments and supplies at this time, but much of it was useless, since neither sufficient gas nor usable electric current was then obtainable.³

Before November 1, 1917, the personnel of the laboratory service in France consisted, in addition to the staff of army laboratory No. 1, of two commissioned officers and a varying number of enlisted technicians with the laboratory of each base hospital then in France.³

A considerable amount of routine clinical pathology was performed during this early period and an autopsy service of practical value conducted. The bacteriologic work done at this time consisted mainly of a study of the organisms concerned in the prevalent infections of the respiratory tract.³ The service for conducting Wassermann reactions was begun in September, 1917. The difficulties to be overcome were many. Little equipment was available, all reagents had to be prepared and standardized, only with the greatest difficulty could guinea pigs be secured, only a low-speed hand centrifuge was available, and it was necessary to use some very primitive equipment.³ At that time it was planned that the Wassermann work for the entire American Expeditionary Forces would be done at army laboratory No. 1, but this proved impractical because of delays in transmitting specimens and reports.³

In the latter part of October, 1917, a division charged with the supervision of the laboratory service of the American Expeditionary Forces was created as a part of the office of the chief surgeon, and Circular No. 2, chief surgeon's office, dated November 9, 1917 (quoted in the appendix), which announced the creation of professional divisions in that office, included among others the division of laboratories. Later in the same month a section of infectious diseases was added to this division.³

The chief surgeon on November 11, 1917, instructed the director of laboratories, A. E. F., to submit plans to organize a division of laboratories and infectious diseases.³ Some information was then available concerning the organization of the laboratory services in the British and French Armies, but it seemed advisable to plan for a somewhat more comprehensive organization with greater centralization and more definite administrative control and coordination than existed in those forces.³ The general projects of organization and phases of development for the American Expeditionary Forces as worked out by the general staff were reviewed, the plans of the hospitalization division of the office of the chief surgeon, including geographic location of hospitals present and prospective (i. e., those leased, under construction, or projected) were studied, and as much relevant information as possible was obtained, concerning the proposed lines of railway communication.³ By means of this information, and the employment as a basis of the preliminary plans for the laboratory service already adopted, a highly developed project for the organization of this division was formulated.¹ On December 29, 1917, a general outline of the proposed organization was submitted to the chief surgeon, and on January 11, 1918, a detailed outline with the statement that plans were already being formulated to effect a number of the features it prescribed.¹ This latter project, which was approved by the chief surgeon, was as follows:¹

ACTIVITIES—DIVISION OF LABORATORIES AND INFECTIOUS DISEASES

SECTION OF LABORATORIES

1. Representative of chief surgeon in all matters relating to laboratory service.
2. General supervision of all laboratories and the assignment of special personnel.
3. Direct supervision of purchase and distribution of laboratory equipment and supplies.
4. Publication of circulars relating to standardization of technical methods, collection of specimens and other matters of technical interest to the laboratory service.
5. Collection and distribution of literature relating to practicable and definite advances in laboratory methods.
6. General supervision of research.
7. Supervision and action on manuscripts of laboratory personnel to be presented to chief surgeon for publication.
8. Cooperation and coordination with the directors of all the professional divisions, in order that medical and surgical problems arising during the war may be most effectively handled from the laboratory point of view.

SECTION OF INFECTIOUS DISEASES

1. Representative (advisory) of chief surgeon in matters relating to the prevention and control of transmissible diseases.
2. Collection and distribution of literature pertaining to practical advances in methods of prevention and control.
3. Preparation of circulars relating to prevention and control.
4. Detail of specially trained units with personnel and mobile material, on request from the division of sanitation, for the investigation of epidemics or threatened epidemics.
5. Experimental investigations of suggested prophylactic methods for the prevention of infectious diseases and recommendations relative to their general adoption.
6. Collection of statistics and epidemiological data on infectious diseases.

A. CENTRAL ORGANIZATION

1. Central offices.

Personnel:

Director of division of laboratories and infectious diseases—

- (a) Assistant director (section of laboratories).
- (b) Assistant director (section of infectious diseases).
- (c) Adjutant; 2 secretaries, 2 clerks, chauffeur and orderly.

2. Central medical department laboratory, A. E. F.

Divisions:

- (a) Bacteriology.
- (b) Serology.
- (c) Pathological anatomy.
- (d) Chemistry (sanitary—medical).
- (e) Medical biology.
- (f) Supplies (diagnostic and therapeutic sera, vaccines, culture media, stains, standard solutions, portable laboratory units, etc.).

Activities:

- (a) Standardization of technical methods.
- (b) Manufacture and distribution of culture media, stains, agglutinating sera, amboceptor, antigen, etc.
- (c) Distribution of diagnostic and therapeutic sera, vaccines, etc., to base, camp hospital, army, evacuation hospital, and divisional laboratory units and to troops.
- (d) Supply of complete transportable and other mobile laboratories for units in the field and for special investigations. (Meningitis, diphtheria, pneumonia, enteric fevers, etc.)
- (e) Supply of laboratory animals.
- (f) Special highly technical chemical and other laboratory work as required.

Central medical department laboratory, A. E. F.—Continued.

Divisions—Continued.

Activities—Continued.

- (g) Standardization of technique and records of post-mortem examinations and supervision of collection of museum specimens to be forwarded to the Army Medical museum.
- (h) Special work on insects (lice, etc.).
- (i) Special research work.
- (j) Instruction of laboratory personnel in technical methods (wound bacteriology, etc.).
- (k) Supply of special personnel and material for the investigation of epidemics.

Personnel:

Commissioned—

- Commanding officer.
- Adjutant.
- Quartermaster.
- Chief, division of bacteriology.
- Assistant, division of bacteriology.
- Chief, division of serology.
- Assistant, division of serology.
- Chief, division of pathological anatomy.
- Chief, division of chemistry.
- Chief, division of medical biology.

Enlisted and civilians (43)—

- 2 secretaries.
- 3 clerks.
- 10 technicians.
- 1 electrician.
- 1 plumber.
- 1 cabinetmaker.
- 1 general carpenter.
- 1 packer.
- 6 chauffeurs.
- 1 mechanic, having general knowledge of autos.
- 1 motor-cycle driver.
- 5 general utility men.
- 10 civilian laborers.

NOTE.—Both commissioned and enlisted personnel will be attached temporarily to this laboratory from time to time, for purpose of instruction. Special mobile units for special investigations and reinforcements will be held in reserve at this laboratory.

The central laboratory will supply culture media, stains, therapeutic sera, standard solutions, and other expendable laboratory items to laboratory units in the intermediate and advance section, line of communications, and the zone of the advance. It will equip, distribute, and replenish the transportable laboratory units for camp hospital laboratories. It will stock and replenish all transportable laboratories (in chests) for special investigations (meningitis, pneumonia, diphtheria, typhoid, dysentery, etc.), and all motorized corps and special mobile laboratories functioning in the intermediate and advance sections, line of communications, and the zone of the advance. In the investigation and control of epidemics and threatened epidemics, it is of the utmost importance that the existence of suspected disease be recognized promptly, in order that measures for its control and prevention may be instituted without delay. Experience has demonstrated already that railway transportation fails absolutely to meet the necessary requirements. All parts of the area served by the central Medical Department laboratory can be reached by motor transportation in from two to eight hours and an adequate motor transportation will be urgently required. The following transportation will be necessary:

- | | |
|---------------------------------|---|
| 1 1½-ton truck. | 1 passenger car (Ford). |
| 2 light Ford trucks. | 2 motor cycles with side cars. |
| 2 Ford ambulances. | 6 motorized bacteriological laboratories (reserve). |
| 1 passenger car closed (Dodge). | |

B. GENERAL ORGANIZATION

(Division of Laboratories)

1. Base laboratories:

(These laboratories will be of two general types: Those functioning directly under the headquarters of the different sections of the Services of Supply and those functioning as base laboratories for single base hospitals or for groups of base hospitals.)

(1) Base laboratories, Services of Supply—

Divisions—

- (a) Bacteriology.
- (b) Serology.
- (c) Pathological anatomy.
- (d) Chemistry (sanitary and medical).
- (e) Supplies (diagnostic and therapeutic sera, vaccines, culture media, stains, standard solutions, etc.).

Activities—

- (a) Manufacture of culture media.
- (b) Distribution of culture media, stains, diagnostic and therapeutic sera, etc., to camp hospital laboratories and base laboratories, base hospitals, in their section.
- (c) Stocking and replenishing special transportable and motorized mobile units functioning in their section.
- (d) Supply of laboratory animals.
- (e) Special research.
- (f) Investigation of epidemics and threatened epidemics in their section by means of special personnel and material attached. (Transportable units in chests for investigation meningitis, diphtheria, pneumonia, dysentery, etc., and motorized bacteriological laboratory for special investigation.)
- (g) Serological and special bacteriological work for camp hospitals, base hospitals, and for troops.

Personnel—

- Commanding officer.
- 2 commissioned assistants permanently attached.
- 2 commissioned assistants to be available for special duty in investigating epidemics.
- The necessary enlisted and civilian personnel.

Transportation—

- 1 passenger car and 1 motor cycle with side car.
- 1 motorized bacteriological laboratory.

(2) Base laboratories, base hospitals—

(These laboratories will be organized for single base hospitals (1,000 beds) and base hospital groups (5,000 to 10,000 beds). They will be well equipped as to personnel and material and capable of doing any work ordinarily carried on in a good laboratory.)

Activities—

- (a) Bacteriological, serological and gross and histopathological work for base hospitals or for groups of base hospitals.
- (b) When necessary, they will be charged with the serological and specialized bacteriological work for camp hospitals in their vicinity.
- (c) Supply of therapeutic sera, vaccines, etc.

NOTE.—The routine pathological work (blood counts, urines, smears, etc.) in base hospital groups will be done by a special personnel in small laboratories in close proximity to the wards. Special base laboratory buildings with adequate space are being provided for in the plans for the construction of groups of base hospitals (5,000 to 10,000 beds).

Transportation—1 motor cycle with side car.

Base laboratories—Continued.

(3) Camp hospital laboratories—

Activities—

- (a) Routine clinical pathological work for camp hospitals (300 beds) and regimental infirmaries (urines, sputum, blood counts, dark field, diphtheria cultures, etc.)
- (b) Collection of specimens from regimental infirmaries (blood for Wassermann, etc.) to be forwarded to base and army laboratories.
- (c) Distribution of reports to regimental infirmaries.

Personnel—

- 1 bacteriologist.
- 3 enlisted technicians.
- 1 motor-cycle driver.

Transportation—1 motor cycle with side car.

Equipment—Transportable expandible units in chests.

(4) Evacuation hospital laboratories—

(These units will be assigned to evacuation hospitals and will have the necessary equipment to do the routine clinical ward work and special work in wound bacteriology for evacuation hospitals.)

(5) Army laboratories—

(Stationary units. Located in permanent buildings in the zone of the advance or in the advance section, line of communications, immobilized well equipped. Directly under the chief surgeon, A. E. F., for administrative purposes. Designated as army laboratories but will not be mobile in the sense of being attached to any particular army and following it as it moves. These laboratories will be organized as necessity for them arises and will be numbered serially.)

Activities—Similar to the activities of base laboratories.

Personnel—

- 4 commissioned.
- 10 enlisted.

Transportation—

- 1 passenger car (closed).
- 1 Ford truck or ambulance.
- 1 motor cycle.

(6) Corps laboratories—

These laboratories will be motorized, mobile units, completely equipped for general bacteriological and epidemiological investigations. They will be numbered serially. They will not be assigned definitely to corps but will be attached to armies, corps, or other units when their services are required. For administrative purposes and purposes of mobility, they will be controlled directly by the chief surgeon.

Activities—Investigation of special problems, epidemics, reinforcement of laboratory units in the zone of the advance, etc.

Personnel—

- 1 commissioned.
- 2 enlisted.

Transportation—1 motorized bacteriological laboratory.

(7) Division laboratories—

(These units will be assigned definitely to divisions and will be under the order of the division surgeon.)

Activities—General routine pathological work for the division, including bacteriological and chemical examinations of water supplies. When the division is in training, the laboratory unit should be attached to the camp hospital in its particular area. When serving at the front, one bacteriologist and technical assistant will be detached for service in wound bacteriology at evacuation hospitals or special surgical units near the front.

Base laboratories—Continued.

(7) Division laboratories—Continued.

Personnel—

- 1 medical officer.
- 1 officer, Sanitary Corps (water).
- 4 enlisted.

Transportation—

The portable laboratory is to be transported on the sanitary train of the division.

1 motor cycle with side car.

Equipment—In chests, each chest containing a complete unit for a definite purpose. Number of units assigned dependent on character of work anticipated. Ordinarily the equipment furnished will meet the requirements for routine clinical examinations (chemical and bacteriological), examinations of water supplies, and wound bacteriology.

(8) Special units—

Motorized mobile units.

- (a) Bacteriological cars.
- (b) Meningitis cars.

Transportable mobile units (in chests)—

- (a) Meningitis units.
- (b) Diphtheria units.
- (c) Pneumonia units.
- (d) Typhoid group, dysentery units.
- (e) Wound bacteriology units.
- (f) Water supply units.
- (g) General bacteriological units.
- (h) Camp hospital laboratory units.
- (i) Division laboratory units.

NOTE.—These special units will be assembled at the central Medical Department laboratory and sent where required. Their expendable supplies (culture media, stains, etc.) will be replenished at the central and base laboratories.

In addition to the functions outlined in this plan, the division of laboratories assumed certain others also; e. g., the collection of statistics on routine and special work done in laboratories, cooperation and coordination with the Chemical Warfare Service, supervision of the collection of museum and photographic records of the Medical Department, and research in a number of medical problems. Furthermore, additional sections later were added to the division, viz., that of food and nutrition, and that charged with supervision of purification of water supplies.¹

Some other modifications of this original plan also proved necessary, the more important being the following:¹ Army laboratories of a stationary type were not organized, and mobile units were assigned to the headquarters of field armies for use in investigations of epidemic disease in the field; corps laboratories were not organized, for only exceptionally could highly specialized, technical, bacteriological work, such as wound bacteriology, be done in evacuation and mobile hospitals during active military operations; the divisional laboratory units usually were unable to function, from the purely laboratory point of view, during combat, and furthermore they required additional equipment when in rest or training areas.¹

However, after the chief surgeon's approval of the plan detailed above, efforts were immediately begun by the director of laboratories to carry it into effect, the organization of the laboratory section and more particularly the establishment of a central (headquarters) laboratory being given first consideration.¹ After a thorough study of the projected line of communications it was decided that the central laboratory should be located at Dijon, which situation presented many natural advantages. The chief reason for selection of this locality was its proximity to the American front and training areas and to the main line of communications.¹ On a visit of inspection to that city by the director of laboratories on December 15, 1917, a modern laboratory building was found which constituted a part of the plant belonging to the University of Dijon. Late in the same month arrangements were completed for taking over this structure and here the central Medical Department laboratory was established on January 1, 1918.¹ On the same date the director of laboratories moved his office to the same point from Neufchateau, where it had been located first in the office of the commanding officer of Army laboratory No. 1, and then in a hut erected beside the laboratory.¹

At Dijon the director's office was first established in the central Medical Department laboratory, but in April, 1918, a temporary wooden office building 100 feet long and 20 feet wide, located on the grounds of the laboratory, was completed and occupied by the director.¹

The preliminary plans for the office provided that only two-thirds of the building would be used for office purposes, the remainder being reserved for storage and expansion if necessary, but even before this plan could be applied the volume of work had so greatly increased that the entire building was arranged for office purposes. One large room served as a combined office and library, partitions dividing the remainder into small offices with connecting doors.¹ The structure was well lighted by electricity and was heated by stoves during the winter months; telephone connections through a local switchboard provided communication both with local and distant offices. Eventually satisfactory telephone connections could be made with places as far distant as Bordeaux, St. Nazaire, and Brest.¹ The director's office remained in this building until it was transferred to the office of the chief surgeon at Tours in June, 1919.¹

The general arrangement of the offices and the relationship of the office buildings to the central Medical Department laboratory are shown in Figure 5.

Until February the director's office force was still limited to one stenographer, but efficient office and other personnel was then procured, adequate to requirements.¹

On February 6, 1918, the director of laboratories was directed to make such journeys as were necessary in matters pertaining to the service of that specialty.¹ Prior to January the urgent necessity for completion of plans for the organization of this division had been such that but little time could be devoted to inspections.¹

During the period from August to December, 1917, inclusive, the plans of organization of the division were elaborated, definitely formulated and adopted: from January to June, 1918, inclusive, the laboratory service underwent active

development; from July to November, 1918, inclusive, it worked under stress; and from December, 1918 to July, 1919, inclusive it underwent demobilization.¹

In the spring and early summer of 1918, a considerable number of additional activities were assigned to the division and new sections were established as mentioned above.¹

On May 22, 1918, the director of laboratories forwarded to the chief surgeon the following letter,⁴ which gave a general summary of organization then effected and projected, and especially stressed the transportation needs of the laboratory service.⁴ Such needs became of very urgent importance later.¹

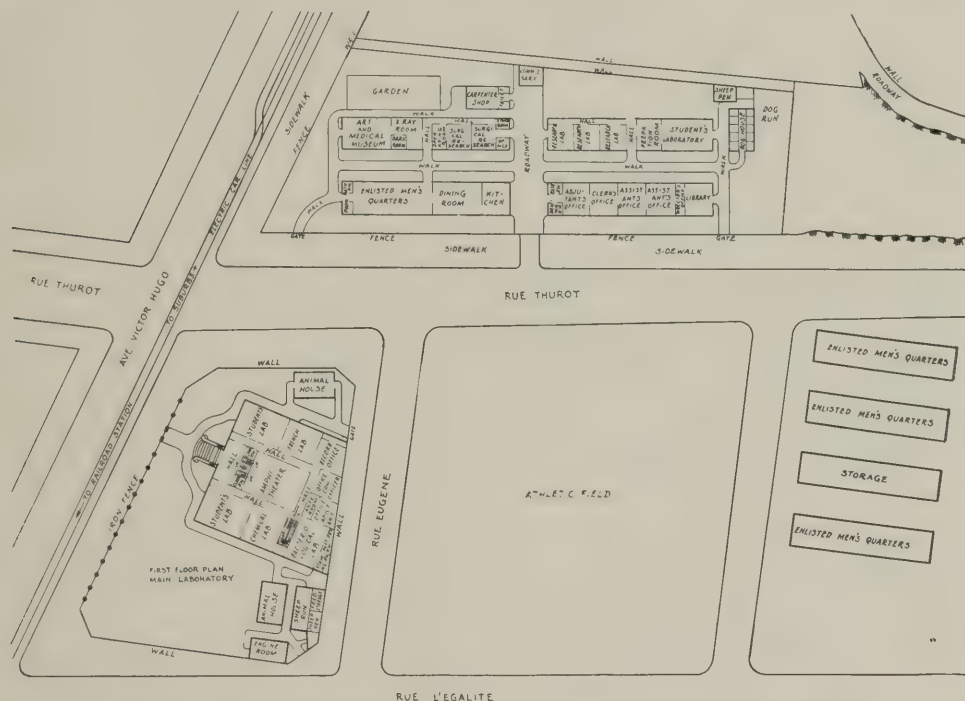


FIG. 5.—Ground plan, headquarters, division of laboratories, A. E. F., and central Medical Department laboratory, Dijon

1. I am inclosing herewith a table of organization for laboratory units that this office considers necessary for the American Expeditionary Forces; as will be noted the laboratories are divided into two basic types: Stationary and transportable.

STATIONARY LABORATORIES

2. *Central Medical Department laboratory.*—This laboratory is situated in the advance section and is thoroughly equipped to do any work that may come up. It is estimated that it will eventually require 25 officers and 50 enlisted men. So far as is possible we are cutting down the enlisted personnel by the employment of civilian technicians and laboratory assistants, thus releasing male personnel for more urgent field duties. The civilian personnel is quite satisfactory and is in reality cheaper than enlisted personnel.

This laboratory, in addition to its permanent personnel, has established laboratories equipped for special investigations. At the present time surgical shock and chest surgery are the subjects of special investigation in special laboratories. The water-supply service, A. E. F., is provided with special laboratories here. We have arranged with the intelligence section, general staff, to organize a special chemical section here for the investigation of

correspondence and the development of invisible inks. Special problems will come up from time to time and this laboratory will be prepared to handle them.

Referring to transportation required for this particular laboratory, it will be necessary to send laboratory personnel out from this center to various parts of the Advance Section and Zone of Advance for investigation of epidemic diseases. The motor cars, light, are required for this particular purpose. It will also be necessary to deliver standardized laboratory units and replenishment supplies to mobile units in the zone of advance, and three motor trucks, medium, and three motor trucks, light, will be required to meet these needs. We have adopted a standard expandable laboratory unit system in chests with the idea that when a special investigation of epidemic diseases is to be undertaken, one of these transportable laboratory outfits can be placed on a motor truck, medium, size $1\frac{1}{2}$ tons capacity, proceed to the area to be investigated, unpack the chests and organize the laboratory in a vacant room. On completion of work of this character the laboratory can be repacked within an hour's time and returned to its station with its own transportation.

Laboratory supplies and sera of various kinds will be required in the front areas, and these can be taken care of (when railroad facilities are not direct or possible) by the light motor trucks and by motor cycle with side car. The two bicycles can be used for messenger work in the city. This laboratory has at the present time three bacteriological cars, motor, and these cars will be used for investigation of special epidemics.

3. *Base laboratories, sections Services of Supply.*—Base laboratories are being organized in each of the sections on the lines of communication. Already one has been established



FIG. 6.—Floor plan of the office of the director, division of laboratories, A. E. F.

for base section No. 1, base section No. 2, and intermediate section, Services of Supply, and stationary laboratories are now en route from the United States for base section No. 3 and base section No. 5. These laboratories will handle the general laboratory work and laboratory work concerned with the prevention of infectious diseases in their respective sections. To carry out this work efficiently and effectively, transportation will be necessary. One light motor car, passenger, is asked for; one motor cycle with side car; one bicycle; and one motor truck, medium. To each of these laboratories one transportable laboratory outfit will be supplied and one $1\frac{1}{2}$ -ton motor truck will be required to transport this laboratory from place to place for the investigation of epidemics.

4. *Base hospital laboratories at base hospital centers.*—We have organized at each base hospital center one laboratory well provided as to personnel and equipment. This laboratory will serve as a central laboratory for the entire group of hospitals, and in this laboratory it is proposed that all highly technical bacteriological and serological work will be done. In addition to this it is the intention to establish a certain number of small clinical ward laboratories in connection with a certain number of wards. By carrying out this arrangement we will conserve building space, equipment and personnel. The only transportation necessary for such a unit is a motor cycle with side car and one bicycle.

5. *Base hospital laboratories at base hospitals.*—These laboratories will be provided for base hospitals of from 1,000 to 1,500 beds. No transportation will be required for such units.

6. *Army laboratories.*—We are organizing in the advance section, or zone of the advance, laboratory units that will be of a fixed character and will be known as Army laboratories. These laboratories will be so located that they will be closely in touch with troops in the line, and it is proposed that all highly technical bacteriological and serological work for divisions in the field be done by these units. They will also be provided with a transportable labora-

tory unit for the investigation of epidemics and will care for epidemics in their particular section. In order to carry out work on epidemics effectively, it will be necessary to supply them with a 1½-ton motor truck for the transportation of the transportable laboratory.

TRANSPORTABLE OR MOBILE UNITS

7. *Camp hospital laboratories.*—We have arranged to supply camp hospitals with transportable units in chests, but as these units are permanent or semipermanent, no transportation for carrying their transportable units will be necessary. They should be provided, however, with a motor cycle with side car, in order that they may be in close touch with infirmaries and other units for which special work will be done.

8. *Evacuation hospital laboratories.*—These units are made up of the standard transportable outfits and consists of eight chests. They should be provided with a 1½-ton motor truck to carry their equipment. This truck will be used constantly by the pathological and museum units attached to the laboratory of evacuation hospitals when not in use.

9. *Mobile hospital laboratories.*—A transportable laboratory unit consisting of eight chests is required for each mobile hospital, and in order that it may be transported one truck, motor, medium, will be required.

10. *Divisional laboratories.*—This laboratory unit is attached to each division, and its equipment consists of three of the chests of the standardized transportable outfits. To make this unit mobile it will be necessary to supply one light motor truck capable of carrying these three chests. This unit will also require one motor cycle with side car.

11. In connection with the transportation provided for in this T. of O., this office is convinced that the laboratory service will not and can not perform its functions properly unless provided with transportation. In working out the organization of supplies for mobile and semimobile units, we have endeavored to standardize equipments, and this has been accomplished by providing an expandable unit laboratory system in chests. These chests are so arranged that a given number of chests will care for the work of camp hospitals and divisions, while the evacuation hospitals and mobile hospitals will require the full number—eight. The British system has been somewhat different. They have organized a unit system consisting of a bacteriological motor car, with the idea that the necessary work would be done in this car. As a matter of practice it has been found that usually the equipment would be taken out of the car and placed in a vacant room provided the unit remained at one place for any great length of time. These cars cost approximately \$7,000. We feel that the system adopted by us will be more satisfactory and will be much cheaper, provided the necessary transportation is furnished. A standardized laboratory unit of chests costs, complete, about \$1,200, and a motor truck of 1½-ton capacity will probably cost in the neighborhood of \$2,000. This makes about \$3,500, while the British units cost from \$6,000 to \$7,000.

12. It will be necessary that the truck transportation allowed for these mobile units be assigned very definitely to these particular laboratory units; otherwise they lose their mobility. Laboratory supplies are difficult to secure. We have heard that during a recent German offensive on the Western Front the laboratory service for the British Army in France were able to save their entire equipment. This was possible by reason of the fact that they had transportation definitely assigned to them.

J. F. SILER,

Lieutenant Colonel, Medical Corps, United States Army.

As mentioned above, the division of laboratories had been included among the professional services prescribed in Circular No. 2, chief surgeon's office, A. E. F., November 9, 1917.³ But that division, being a part of the division of sanitation in the chief surgeon's office, and therefore in a somewhat different administrative position from the other professional services which were under control of the hospitalization division, was not grouped with these when they were reorganized by Circular No. 25, chief surgeon's office, A. E. F., May 5, 1918, and by General Orders, No. 88, G. H. Q., A. E. F., June 6, 1918.

The director of the division of laboratories enjoyed entire freedom in the organization and development of his department except that all matters of policy and those affecting the service in general were submitted to the chief of the division of sanitation for final decision.¹ The director was authorized to issue circulars, memoranda, and special letters of instructions concerning matters of interest in the laboratory service. Memoranda which were of interest to the Medical Department at large were submitted to the chief surgeon and issued as circulars from his office.¹

At the time the office of the director of the division was established at Dijon, that of the chief surgeon was located at Chaumont, and because of their proximity there were then no great difficulties of coordination. But after the chief surgeon's office was transferred to Tours, in March, 1918, the unavoidable congestion of telegraph and telephone lines, necessary censorship regulations, and irregular mail facilities often caused considerable delay in receipt of orders affecting transfer of personnel.¹ This situation was remedied by granting to the director of the division in August, 1918, authority to issue suitable orders to personnel under his control whereby he could meet emergencies and fill existing vacancies from the reserve staff on duty at the central medical department laboratory.¹ Thereafter the efficiency of the laboratory service was greatly increased, particularly by promoting both the early investigation of epidemic diseases and quick response to emergencies that developed during combat. Better coordination would have been secured if the director's office had been located in the office of the chief surgeon, for delays which occurred at time in communication would have been obviated.¹ But many and greater office advantages accrued from maintenance of close contact between the director's and the central Medical Department laboratory at Dijon.¹ The laboratory was so located that it was less than six hours distant from 1,500,000 troops and from hospitals with a total capacity of more than 100,000 beds. Request was made of the hospitalization division of the chief surgeon's office that the director be promptly apprised of the arrival and location of all hospital units arriving overseas.¹

GENERAL CORRELATION AND ACTIVITIES

In order to correlate the work of the division with the activities of the Medical Department in general, the following methods were employed:¹

Letters covering the progress of the work and plans for the future were written at frequent intervals to the chief of the division of laboratories in the office of the Surgeon General at Washington, and in July, 1918, an officer was sent to Washington in order to give more definite information concerning the various problems confronting the laboratory service of the American Expeditionary Forces.¹

The director had frequent conferences with the head of the division of sanitation in the chief surgeon's office, the progress of the work being reviewed and special matters brought up for final action.¹

Weekly reports, covering the general activities of the division were submitted to the chief surgeon and copies forwarded to the Surgeon General.¹

Copies of all reports on investigations of epidemics as well as reports that were considered of sufficient interest were transmitted to the chief surgeon for his information.¹

When general or technical circulars involving action by some other division or service were contemplated, that division or service was consulted, and approval and cooperation secured before the circular was published.

A special mailing list was prepared, including divisions of the chief surgeon's office, the professional divisions, the sanitary school, the Pasteur Institute, the adviser in pathology to the British Expeditionary Force, the secretary of the British research committee, the secretary of the research committee of the American Red Cross, and individual officers on duty with the American Army, the French Army, the British Army, and the Italian Army, to all of whom special memoranda, etc., were forwarded.¹

Officers of the division represented it at the meetings of the Inter-Allied Surgical Congress.¹ The director of the division attended sessions of the research committee organized by the American Red Cross, of which committee he was a member.¹

Matters affecting the medical and surgical services were taken up through liaison officers appointed for this purpose by the chiefs of those services. These matters, in so far as the medical service was concerned, included, among others, control of epidemic diseases.¹

All matters relating to water supplies were taken up with the senior representative of the Medical Department with the water supply service, A. E. F.¹

In the summer of 1918, it was planned to initiate conferences of special groups of officers at stated intervals for the purpose of discussing special features of their work and the local problems with which they had to contend.¹ These meetings were to be held every month or six weeks, at the central Medical Department laboratory, and were to be limited to groups of officers engaged in identical lines of work.¹ One meeting was to include the commanding officers of base laboratories operating in the different sections of the Services of Supply, and the officers engaged in disease control; one was to include the commanding officers of base laboratories in hospital centers; another the laboratory officers of evacuation and mobile hospitals; another the officers in charge of division laboratories, etc.¹ But because of combat activities it was not possible to call the first conference until November 1 and 2, 1918.¹ This was attended by the chief of the division of sanitation, chief surgeon's office and his assistant, by the commanding officers of the base laboratories functioning in the sections of the Services of Supply, by sanitary inspectors of the sections of the Services of Supply, and others.¹

After the signing of the armistice, conditions became so unsettled that it was not practicable to continue these conferences.¹

DIRECTOR'S OFFICE

ADMINISTRATIVE DETAILS

For administrative purposes the office of the director, division of laboratories and infectious diseases, was divided into six general sections with one or more officers on duty in each as assistants to the director. These sections were: (1) Executive office and records, (2) central Medical Department laboratory, (3) section of laboratories, (4) section of infectious diseases, (5) food and nutrition section, and (6) water supply section.¹

The offices of the director and those of the chiefs of all the sections were located in the same building except that the commanding officer of the central Medical Department laboratory had his office in an adjoining structure.¹

While the ensuing text attempts, for the purpose of clarity, to discuss separately the several sections of the division of laboratories and infectious diseases, there was such close coordination and overlapping of several of these that note should be made of that fact.¹ Certain officers on duty at headquarters of this division at Dijon were also on the staff of the central laboratory or on that of the laboratory section.¹ The central laboratory while a part of the general laboratory system, was highly individualized, and from an administrative point of view was differentiated from the section of laboratories in this division, but the activities of the latter were often supplemented by those of the former, as in the solution of special problems and in other matters noted below.¹

The records pertaining to all sections of the office of the director, except autopsy protocols and statistical reports, were centralized in a single file, controlled by the same decimal filing system which was in use throughout the Army.¹ Incoming mail was classified by the adjutant and distributed directly to the officers concerned. Reports and documents of general interest went first to the desk of the director and were then circulated in the office before going to file.¹ Correspondence and other matters requiring routine action were acted on by the officer directly concerned and only such matters were brought to the attention of the director as were considered to be of interest to him, or concerning which his decision was required.¹

Matters of general policy were taken up by the director with the officer or officers directly concerned and if considered desirable, with all members of the staff who might have special knowledge of the subject or from whom advice would be of value.¹

Special memoranda, circulars and forms were prepared ordinarily by the section most directly concerned, but those of special importance were reviewed by several members of the staff. These memoranda and circulars were of two general types: Those covering subjects of general interest to the entire Medical Department, and those covering technical matters pertaining to the laboratory service.¹ The former were forwarded to the chief surgeon for incorporation in official circulars issued by his office, while the latter were issued and distributed directly from the office of the director as "office letters," "memoranda," or "forms," those in each class being given serial numbers.¹ A general idea of the material forming the subject matter of circulars and memoranda may be gained from the lists given in the appendix.

The commissioned personnel of the division of laboratories was distributed and assigned mainly by the officer at the head of the laboratory section, with suggestions, in some instances, from the director.¹ The distribution of the special personnel on duty in the sections of food and nutrition, of water supply, and of infectious diseases were assigned on the recommendation of the officer in charge of those sections, respectively.¹

The personnel of this division consisted of officers of the Medical Corps with special training in laboratory procedures, sanitation, and epidemiology, or

other special qualifications; officers of the Sanitary Corps who were sanitary engineers, had special knowledge of food and nutritional problems, were competent to make field surveys and laboratory examinations of water supplies, had general or special qualifications in laboratory procedure, were artists, photographers, executives, or possessed other special qualifications; and enlisted men, many of whom had a special technical training.³

Not more than 12 officers of the Regular Medical Corps and of the Sanitary Corps, who served with the division of laboratories, had any service in the Army prior to the war.³ Two of these medical officers and one officer of the Sanitary Corps were on duty in the office of the director, the others being assigned to laboratory administrative positions elsewhere in the American Expeditionary Forces.³ The remaining personnel, consisting of approximately 670 officers, was drawn chiefly from civil laboratories.³ Many of the enlisted personnel were college graduates, undergraduate students, or men with special technical training in laboratory work of various kinds. As with the Medical Department generally, there was always a shortage both of total personnel and of those competently trained.³

The personnel to carry on the activities of the division of laboratories was acquired from various sources, mainly the following:³ (1) Base hospitals and a considerable number of evacuation hospitals, for the prescribed organization of both those types of units included laboratory personnel; (2) stationary laboratory units, of which 5 were sent to France, each consisting of 6 officers and 12 enlisted men; (3) special units sent to France for special, highly technical activities; (4) divisional laboratory units automatically dispatched to France for service with divisions; (5) detachments of casualties sent to France on cable requests from general headquarters. (6) The general medical service of the American Expeditionary Forces whence a considerable number of specially trained officers were drawn and assigned to duty with this division.³

All casual personnel and special units arriving in France for service in this division were automatically ordered to the central medical department laboratory, where their special qualifications were investigated and any necessary special instruction given.¹

The individual qualification cards of officers of the Medical Department on file in the headquarters office of the division permitted a broad general classification of qualifications, but for the highly technical activities in which the division of laboratories was engaged it was necessary to have a much fuller knowledge of the special qualifications of each officer.³ A questionnaire, covering in detail the information desired, was therefore filled in by each officer on duty in the division of laboratories and filed in the office of the director.³ A still better conception of the special qualifications of the individuals was gained by direct observation of from 300 to 400 of these officers who served on temporary duty at the central Medical Department laboratory either as casualties or as students, taking courses of instruction.³ These officers were interviewed by the personnel officer on duty in the office of the director of the division, and ratings of those undergoing instruction were submitted to him. From these sources of information and from inspections of the work being done in the different laboratories an effort was made so to classify and dis-

tribute the personnel that the necessary activities might be more efficiently performed and elimination of the incompetent effected.³ The laboratory personnel sent to France with the earlier base hospitals was made up, as a rule, of highly trained and competent men. This statement also applies to many of the special units.³ The special laboratory training of a considerable percentage of the officers, however, consisted only of the training ordinarily acquired in medical schools plus a short course of training at the Army Medical School, at the Yale Army Medical School, at the Rockefeller Institute, or at more than one of these institutions.³ Therefore, special courses of instruction in the bacteriology of epidemic diseases and in the bacteriology of war wounds were given at the central Medical Department laboratory, approximately 250 officers taking one or the other of these courses.³ Because of the scarcity of trained administrative personnel it was not practicable to form two detachments, one consisting of casuals under the administrative control of the director's office, and the other of permanent personnel assigned to the central Medical Department laboratory.¹ Therefore, both permanent personnel and casuals were carried on the records of the detachment at the central Medical Department laboratory as of a duty status, for rations, quarters, personal equipment and for statistical and other matters pertaining to the interior administration of a detachment.¹ A list of the permanent personnel on duty at the central Medical Department laboratory was kept by the adjutant in the director's office. It was understood that all other personnel was to be considered as casual and subject to assignment by the director without previous consultation with the commanding officer, central Medical Department laboratory.¹ After investigation of their qualifications and any necessary special instruction, officers of this division were assigned to appropriate stations.¹

The division of laboratories was charged with the organization of new laboratory units and the distribution of personnel under its supervision. All requests for laboratory personnel were referred to it, and assignments and changes in station made on recommendation of the director.³

While in May, 1918, less than 140 commissioned officers were engaged in activities under the supervision of this division, by November, 1918, this number had increased to 683.³ Their distribution, by corps, grade, and general duties, is shown in the following table:³

Personnel on duty in division of laboratories and infectious diseases in November, 1918

	Colonels	Lieutenant colonels	Majors	Captains	First lieutenants	Second lieutenants	Totals
Section of laboratories and infectious diseases:							
Medical Corps.....	1	10	20	124	317		472
Sanitary Corps.....			2	6	64	76	148
Section of food and nutrition: Sanitary Corps.....			4	11	15	2	32
Section of water supplies: Sanitary Corps.....		1		5	15	10	31
	1	11	26	146	411	88	683

PERSONNEL^a

Col. Joseph F. Siler, M. C., chief.

SECTION OF LABORATORIES

Col. George B. Foster, jr., M. C., chief.

Lieut. Col. William J. Elser, M. C.

Maj. Ward J. McNeal, M. C.

SECTION OF INFECTIOUS DISEASES

Col. Richard P. Strong, M. C., chief.

Col. Hans. Zinsser, M. C., chief.

Maj. Ward J. McNeal, M. C., chief.

Maj. Richard M. Taylor, M. C., chief.

SECTION OF WOUND BACTERIOLOGY

Lieut. Col. William J. Elser, M. C., chief.

Maj. Benjamin Jablons, M. C.

SECTION OF WATER SUPPLIES

Maj. Harry B. Hommon, San. Corps, chief.

Capt. Machael J. Blew, San. Corps.

Capt. Alvin R. Harnes, San. Corps.

Capt. Walter C. Russell, San. Corps.

Capt. Emery J. Theriault, San. Corps.

First Lieut. Henri E. St. Pierre, San. Corps.

SECTION OF FOOD AND NUTRITION

Maj. Walter H. Eddy, San Corps, chief.

Maj. Phillip A. Shaffer, San. Corps, chief.

Maj. David Klein, San. Corps.

Capt. Fred F. Flanders, San. Corps.

First Lieut. S. C. Dinsmore, San. Corps.

MUSEUM AND ART SECTION

Col. Louis B. Wilson, M. C., chief.

Maj. Henry W. Cattell, M. C.

LABORATORY OF SURGICAL RESEARCH

Lieut. Col. Walter. Cannon, M. C., chief.

Lieut. Col. J. L. Yates, M. C.

^a In this list have been included the names of those who at one time or another were assigned to the division during the period July 28, 1917, to July 15, 1919.

There are two primary groups—the heads of the division or the section and the assistants. In each group names have been arranged alphabetically, by grades, irrespective of chronological sequence of service.

REFERENCES

- (1) Report from Col. J. F. Siler, M. C., director of laboratories and infectious diseases, A. E. F., to the chief surgeon, A. E. F., undated. Subject: Activities of division of laboratories and infectious diseases, from August, 1917, to July, 1919. On file, Historical Division, S. G. O.
- (2) Letter from the chief surgeon, A. E. F., to the Surgeon General, U. S. Army, August 12, 1917. Subject: Outline of laboratory organization, A. E. F. On file, Record Room, S. G. O., 322.15-16 (A. E. F.) (Y).
- (3) Report from the chief surgeon, A. E. F., to the Surgeon General, U. S. Army, May 1, 1919. Subject: Activities of the chief surgeon's office, A. E. F., to May 1, 1919. On file, Historical Division, S. G. O.
- (4) Letter from Lieut. Col. J. F. Siler, M. C., director of laboratories, A. E. F., to the chief surgeon, A. E. F., May 22, 1918. Subject: Table of organization for laboratory units. On file, A. G. O., World War Division, chief surgeon's files, 451.

CHAPTER X

THE DIVISION OF LABORATORIES AND INFECTIOUS DISEASES (Continued)

THE CENTRAL MEDICAL DEPARTMENT LABORATORY

HOUSING FACILITIES

A building, loaned for the purpose by the University of Dijon, was utilized by the central laboratory, established at Dijon on January 1, 1918. When taken over the building was not equipped but early in February it was recon-



FIG. 7.—Central Medical Department laboratory, Dijon. The main building is in the center of the background

structed as a modern laboratory and completely equipped with material brought from the United States for work of general and special character.¹

By March, 1918, the buildings consisted of the initial large laboratory structure, four barracks donated by the American Red Cross which housed the office of the director of laboratories, a large laboratory for instruction of student officers, five well-equipped research laboratories, an operating room for experimental surgical research on animals, a complete X-ray installation with photographic dark room, space for the art and museum section, and messing facilities and quarters for the enlisted personnel.¹ Fixtures for gas, water, and electricity, a very complete plumbing and sewerage system, and equipment

for general and special laboratory activities were installed in the buildings used for laboratory purposes. Later, four small Abinecourt barracks were added to provide animal houses and a carpenter shop, and four additional barracks were erected for accommodation of enlisted personnel and storage of supplies.¹ The laboratory also secured two buildings for garage space and operated a breeding farm for laboratory animals, on funds privately donated for special research. The entire plant eventually occupied 18 large and small buildings.¹

PERSONNEL

When established at Dijon, the central laboratory was staffed by officers from Army Laboratory No. 1, at Neufchateau. By March, 1918, the staff consisted of 16 officers, 35 enlisted men, and 12 civilian employees.¹ The average personnel on duty at the central laboratory between June and November, 1918, was 24 officers, 93 enlisted men, and 23 civilian employees. From November, 1918, to May, 1919, the average personnel remained approximately the same.¹

LABORATORY EQUIPMENT AND SUPPLIES

One of the greatest difficulties that confronted the laboratory service in the early months of the war was a shortage of equipment and supplies.¹ Before the war many essential technical items, notably of apparatus, glassware, dyes, and chemicals, had been imported from Germany. American industries that had begun to manufacture these articles were still lacking in quantity production in many essentials.¹ Furthermore, the normal peace-time stocks of dealers in scientific apparatus and supplies were just sufficient to meet the comparatively meager demands for the upkeep of established institutions and the initial equipment of an occasional new one.¹ Demands such as were made by the Army in the earlier months of the war were unheard of and they could not be met until American scientific industries became organized for quantity production. The situation was further complicated by priority schedules on raw materials, many chemicals, and skilled labor, which diverted these to other war industries; and a priority on shipping and tonnage that made the floating of supplies secondary to the transportation of troops. The congestion at base ports, American Expeditionary Forces, and shortage of transportation in France militated against prompt handling of supplies after their arrival in France.¹

With the exception of the initial equipment of three of the larger laboratories and the laboratory equipment of a few base hospitals, laboratory supplies from the United States were not available for issue in appreciable quantities until about a month before the armistice. Furthermore, laboratory supplies in large quantities were never available by purchase by us in France.¹

When it became apparent that months would elapse before the automatic supply of apparatus from the United States would become available, an attempt was made to reduce equipment and supplies to the absolute minimum consistent with efficiency, and to standardize the equipment of laboratory field units.²

On August 19, 1917, an order for two motor bacteriological laboratories, each to consist of a small but well-equipped outfit mounted on a 3-ton chassis, was placed with a British manufacturing firm. This order contemplated the first use of such a unit in our service and was frankly experimental.³

The supply division of the chief surgeon's office, A. E. F., had made provision for the shipment from the United States of such laboratory supplies as appeared on the supply table of the Manual for the Medical Department, 1916, but this list included only 84 items, which were quite inadequate to meet even the simplest requirements.² To meet the existing emergency, such supplies as were available were purchased in France and contracts made by the supply division for the continuous supply by French manufacturers of certain bulky items requiring a very considerable amount of cargo space.² In coordination with the supply division of the chief surgeon's office, requisitions were prepared covering estimated future requirements with a view to their inclusion among supplies shipped automatically from the United States.² The shipment of laboratory equipment according to this revised list did not begin until April, 1918, and did not become available for issue in France in quantity until October, 1918.²

On January 12, 1918, the director was authorized to place direct with the purchasing agent for the Medical Department in Paris, orders for the purchase of standard laboratory equipment and supplies, except in the case of special supplies desired in large quantity, or when the expense involved was large.⁴ Requisitions were also placed in England and some supplies obtained from the American Red Cross.²

In the detailed plan for the organization of the division of laboratories submitted to the chief surgeon, A. E. F., on January 11, 1918, the director of that division recommended that special motorized and transportable units be provided.⁵ The motorized units were to be installed in their own cars while the transportable units, packed in chests, were to be moved by any transportation available.⁵ This plan, which was approved, provided for motorized laboratories of two classes: Bacteriological cars and meningitis cars.⁵

On the same date the director of laboratories wrote that several completely equipped motorized laboratories were urgently needed.⁶ The next day the chief surgeon, A. E. F., authorized the purchase of a "cerebrospinal" bacteriological car to cost £1,892, exclusive of the chassis,⁴ and on January 14 he authorized the purchase from the French Medical Department of one motorized bacteriological laboratory to cost approximately \$8,000.⁷

In order both to conserve and standardize the equipment of field units, the commanding officer of the central Medical Department laboratory undertook to design a transportable laboratory in which the necessary equipment and supplies would be reduced to approximately 150 items.² These items were to be packed in eight chests so designed as to be capable of expansion in numerous ways if necessary, to meet the essential needs of any type of laboratory. The selection of equipment for a set of these chests which would constitute a division laboratory, also was undertaken.²

In reply to a query from chief of staff, G. H. Q., A. E. F., concerning transportation which the division of laboratories would require, the chief surgeon replied, on February 4, 1918, in part, as follows:⁸ "The increase of the forces and the prevalence of epidemics would require that the laboratory service be furnished among other vehicles with 6 motor trucks and 10 special bacteriological cars." On February 11, the chief surgeon initiated a cable-

gram to the War Department asking that personnel requested for divisional laboratories be sent in accordance with the priority schedule, but that portable field laboratories be substituted for laboratory cars.⁹ On March 1, 1918, the director, division of laboratories, reported that two motorized laboratories each mounted on a 3-ton chassis were en route from England, but that it was anticipated that eight more of these outfits would eventually be required.¹⁰ While most movable laboratories were to be of the type which utilized chests, it was planned that a relatively small number of motorized laboratories would also be employed. Under this plan the equipment for a divisional laboratory would be contained in a set of three chests and a $\frac{3}{4}$ -ton truck would be required for its movement. The laboratory for an evacuation or mobile hospital would consist of a complete set of eight chests transportable on a $1\frac{1}{2}$ -ton truck.^{2, 1, 11}

Toward the end of March, 1918, the commanding officer of the central laboratory visited England with a view of determining the possibility of purchasing laboratory material to equip the series of chests which he had devised, and other assemblages of material.²

On April 29, he telegraphed the chief surgeon, requesting him to authorize the purchasing officer of the American Expeditionary Forces in London to purchase 100 transportable laboratory units at approximately \$1,000 each. The average cost of the truck on which one complete set could be transported, he added, would be \$3,400.¹² The chief surgeon complied with this request.² Deliveries of the units which began on May 8, were completed October 24, 1918, so each division and each mobile or evacuation hospital which arrived in France after the former date, was given its equipment before it entered the advance zone.² Such transportable laboratory units, attached to mobile and evacuation hospitals, were equipped adequately for the performance of all types of clinical and bacteriological work. Those attached to divisions were equipped for the chemical and bacteriological examination of water supplies, the performance of routine clinical examinations and the bacteriological examinations necessary for the control of epidemics.² This transportable equipment was also utilized with very satisfactory results in many camp and base hospitals, and in some hospital centers and base laboratories, pending the arrival of the equipment for stationary units.²

As noted in the preceding chapter, on May 2, 1918, the director of laboratories submitted a complete schedule of the transportation which would be required by the division of laboratories and requested that this be furnished. He also asked that motor cycles with side cars be issued to the laboratories assigned to divisions, for these vehicles already had facilitated collection of water samples and the prosecution of investigations in outbreaks of infectious diseases.¹³ This transportation schedule in so far as it pertained to movable laboratories was approved by the chief surgeon and was forwarded by him for approval to the general staff, general headquarters,¹⁴ but despite repeated subsequent requests, approved by the chief surgeon, transportation for the laboratory units in question was procured with the greatest difficulty and only to a partial degree with the results noted below in the consideration of divisional laboratories.²

On July 8, the director of laboratories reported to the chief surgeon, A. E. F., that the earlier divisions arriving overseas had brought with them their laboratory personnel and equipment, that since that time it had been learned that equipment could be simplified and that tonnage requirements could be reduced by the purchase of all the materials required in England, but that field transportation was essential if these units were to be of value.¹⁵ Similarly, on the 16th of the same month, he reported that the laboratories with mobile and evacuation hospitals had already rendered invaluable service, but that neither the laboratories of the hospitals mentioned nor those of divisions could function properly without transportation, and he urged its provision. Other pleas and arguments for transportation were forwarded, but because of the general shortage of transportation throughout the American Expeditionary Forces, they were only partially successful.¹⁶

Because of the considerations mentioned in the letter of May 22, 1918, quoted in the preceding chapter,¹⁷ and the further fact that the laboratory cars being of special design and equipment, could be manufactured in limited numbers, none other than the four above mentioned were procured.¹⁸

On November 4, the chief surgeon wrote the director of the Motor Transport Corps that the time consumed in the manufacture of specially constructed laboratory trucks and bacteriological cars had been so protracted, and the difficulty of their transport to France so great, that ordinary cargo trucks had been substituted for them and that the specially constructed laboratory trucks were not needed.¹⁹

When the Armistice was signed two of these motorized laboratory units were attached to the general laboratory, one was with Army laboratory No. 1 at Neufchateau, and one with the Second Army.² Motorized laboratories, or field laboratory cars, as they were officially designated, are further discussed under Army laboratories below.

Circular No. 40 of the chief surgeon's office published July 20, 1918, provided that the laboratories of the American Expeditionary Forces would be of two general types, stationary and transportable. The latter were to serve evacuation and mobile hospitals and divisions, and their equipment was to consist of standardized, expendable units in chests.

In the period from July to November, 1918, a large number of hospital centers were established and the equipment and organization of these were expedited.

In September, 1918, a bulletin was prepared by the commanding officer of the central laboratory, which covered in detail all matters relating to the procurement of laboratory supplies by Medical Department units, A. E. F.² This bulletin which provided for a standardization of equipment was distributed to all units. It is reproduced in the appendix.

On September 19, 1918, the Surgeon General wrote that he desired that the field laboratories be numbered, and he allotted to the chief surgeon numbers from 1 to 45, inclusive, for such of these formations as already were overseas or en route. Records of the Surgeon General's office at that time showed that laboratories had been sent to France with 31 divisions, but had not accompanied 6 others.²⁰ In reference to this record the director of laboratories stated that

in point of fact many of these units had not actually accompanied their divisions from the United States; that some had come after them, and that in all instances it had been necessary for the director of laboratories to find personnel in the American Expeditionary Forces who could be trained and assigned to this service.²¹ In view of the signing of the armistice the proposed enumeration of laboratories engaged in field service never became effective.²²

ACTIVITIES

As soon as the central laboratory was thoroughly organized the development was begun of those phases of its activities which related more particularly to the general activities of the laboratory service throughout France.²

The central laboratory came into more intimate contact with the American Expeditionary Forces in general than did any other section of the division of laboratories.² It was planned that the officer commanding this institution would, with those at the head of other sections of the division, have his main office in that of the director of laboratories where he would be engaged only in larger problems affecting the service of the laboratory to the entire American Expeditionary Forces and that his adjutant would care for the administrative details intrinsic to the central laboratory itself.² But because of shortage of personnel, this plan was not practicable and the commanding officer of the central laboratory, in addition to supervising its professional work, and conforming its general activities to the plans of the director of the division, discharged in great detail many administrative duties connected with its organization, equipment, and operation.²

The central laboratory at Dijon and the other laboratories in the division of laboratories were highly coordinated, and except as specified below, their activities were developed concurrently.² These common interests included technical advice on general bacteriology, immunology, serology and other laboratory procedures, control of epidemics, bacteriology of war wounds, special instruction, personnel, laboratory equipment and supplies, gross and histopathology, museum and art service, photographic history of Medical Department activities, inspections, medical and surgical research, and liaison with other services.²

The activities of the central Medical Department laboratory which was in reality the headquarters laboratory for the American Expeditionary Forces conformed to those itemized on the project submitted January 11, 1918, which is quoted in the preceding chapter. These activities may be summarized as follows:¹

Bacteriology.—The work consisted in the standardization of technical bacteriologic methods; the investigation of new technical methods; the preparation of all culture media for stocking transportable laboratory units and mobile laboratories in the zone of the advance; laboratory studies on the incidence of communicable diseases, notably influenza, pneumonia, diphtheria, meningitis, and intestinal diseases; the isolation, intensive study, and classification of the aerobic and anaerobic bacteria concerned in wound infections and gas gangrene; experimental and practical tests of the efficacy of antitoxic sera in the prophylaxis and therapy of gas gangrene; the identification of cul-

tures of microorganisms received from other laboratories; the preparation of bacterial antigens and vaccines; the propagation and study of lice concerned with the transmission of trench fever. These activities were carried on in addition to the ordinary routine bacteriologic examinations.¹

Serology.—This included standardization of the Wassermann test and manufacture and supply of amboceptor and antigen to all laboratories performing the test. The diagnostic sera furnished the laboratories of the American Expeditionary Forces for the identification of pathogenic microorganisms, as well as human sera for typing donors and recipients for blood transfusion, were prepared in this division. A considerable volume of routine serologic work, notably Wassermann tests, was also accomplished.¹

Pathology.—Pathology was concerned with the performance of all autopsies at Base Hospital No. 17, at Dijon, the gross examination and histologic study of operative and autopsy tissues; the collection and preparation of specimens for the Army Medical Museum, and the review of the protocols of all autopsies performed in the American Expeditionary Forces. The latter activity was of value in checking errors in diagnosis. A collection of photographs, moving-picture films, paintings, charts, etc., was prepared for the Army Medical Museum.¹ The administration of the pathological service is considered at greater length elsewhere in this volume.

Chemistry.—The activities of the chemical laboratory covered routine medical chemistry, the examination of foods for the Food and Nutrition Section and the Quartermaster Department, toxicological examinations, investigations of the medical properties of mustard gas, examination of drugs and other supplies furnished the Medical Department, and sanitary and industrial water analyses.¹ During battle activities this division manufactured many thousand liters of gum-salt solution for intravenous use in the resuscitation of the seriously wounded.¹ The laboratory also prepared standard solutions and reagents for transportable laboratories and such other laboratories as were not equipped to prepare their own.¹ So much of the chemical service as pertained to the water supply or food and nutrition sections is discussed with those subjects elsewhere in this volume.

Surgical research.—In the laboratory of surgical research experimental studies on animals were fruitful in their bearing on the prevention of wastage from battle casualties. The cause, prevention, and treatment of surgical shock were studied experimentally here and the results applied practically at the front during the Chateau Thierry and subsequent military operations. Experimental attempts to place wounds of the chest in the category of those amenable to treatment by "débridement," and studies of the relation of various anesthetics and methods of anesthesia to the production of shock were also made.¹

Epidemiological investigation.—Perhaps the most important work of the laboratory from the practical point of view was that concerned with the laboratory and epidemiologic investigation and control of communicable diseases.¹ Specially trained commissioned and enlisted personnel with mobile equipment were held in reserve at this laboratory for the prompt investigation of epidemics or threatened epidemics anywhere in the American Expeditionary Forces. By bacteriologic detection of early cases of communicable diseases, mild cases

missed clinically, and carriers, this laboratory did much to prevent the spread of influenza, pneumonia, diphtheria, meningitis, and enteric infections, and thus decreased the wastage concomitant with outbreaks of these diseases when not detected early and effectually controlled.¹

Supplies.—The supply division of this laboratory was charged with assembling, equipping, and issuing transportable laboratory equipment to mobile units; replenishing expendable items and replacing those that had become unserviceable; issuing to mobile laboratory units and to camp hospitals various culture media and reagents required for bacteriologic work in the field; and issuing to all Medical Department units in the geographic region served by the central Medical Department laboratory, the various biologic products used in the diagnosis, prevention, and treatment of infectious diseases.¹ During the period of active participation of our troops at the front, the greater portion of these supplies was delivered by courier service, necessitating the constant operation of numerous motor trucks and motor cycles.¹

Courses of instruction.—From its inception this laboratory conducted courses of instruction in professional subjects.¹ One hundred and fifty-eight student officers were given two-week courses of instruction in the bacteriology of war wounds; while in the laboratory of surgical research a six-day course, repeated weekly, was given to prospective members of shock teams. This course covered the experimental evidence that had been gathered concerning the cause, prevention, and treatment of surgical shock, and its practical application to the resuscitation of the seriously wounded. Selected student officers in lesser numbers were also given special courses in epidemiologic laboratory methods, in serologic work, and other laboratory procedures.¹

Cooperation with Chemical Warfare Service.—In August, 1918, close contact was established with the consulting pathologist of the Chemical Warfare Service, A. E. F., and arrangements were completed for study of the effects produced on human beings by known and unknown types of gases.²³

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CHAPTER XI

THE DIVISION OF LABORATORIES AND INFECTIOUS DISEASES (Continued)

THE SECTION OF LABORATORIES; ^a TECHNICAL WORK OF LABORATORIES

THE SECTION OF LABORATORIES

The laboratory section of the division of laboratories was distinct from the central laboratory, but closely connected with it.¹ Its headquarters at Dijon exercised technical supervision over the Medical Department laboratories throughout the American Expeditionary Forces, and was charged with their inspection and supply, the pathological service of the American Expeditionary Forces, special research, the collection of museum specimens, photographs, and other art records of medical department activities, cooperation with the water supply and gas defense services, and the destruction of rodents.¹

From the viewpoint of the nature of their activities, the laboratories of the American Expeditionary Forces were divisible into two general types which were comparable, respectively, to the laboratories which served boards of health in civil communities, and those which served hospitals.¹

The base laboratories located in the sections of the Services of Supply, and the mobile units attached to armies and the divisional units were concerned mainly in the control and prevention of transmissible diseases, while the principal activities of all other units were similar to those carried on in laboratories pertaining to the larger and better hospitals in civil communities in the United States.¹

Also, from the viewpoint of equipment, the laboratories of the American Expeditionary Forces could be classified into two general categories: Stationary or mobile.¹ The equipment furnished the stationary units was quite similar to that used in hospitals in civil communities in the United States though in some respects it was not so elaborate. For example, provision of apparatus for blood chemistry was considered but was excluded because of its very questionable practical importance under war conditions.¹ On the other hand, the equipment furnished laboratory units attached to the headquarters of the armies, to evacuation and mobile hospitals, and to divisions was packed in special chests to facilitate transport. These units were constantly moving from place to place as the zone of battle activity shifted from one section to another.¹

The general laboratory system for the American Expeditionary Forces is shown diagrammatically in Figure 8.

As shown by Table 4, 278 laboratories conforming to the different types outlined above were in the service of the American Expeditionary Forces on November 11, 1918, the date the armistice was signed.¹

^a The Medical Department laboratories which did not pertain to the division of laboratories of the chief surgeon's office are discussed in other chapters of this volume. Thus the dental laboratory is discussed under the chapter pertaining to dental division of the chief surgeon's office.

TABLE 4.—Types and numbers of laboratories in operation in the American Expeditionary Forces, May, 1917, to April, 1919¹

	1917								1918								1919							
	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
Central Medical Department laboratory									1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Base laboratories, sections of Services of Supply ^a			1	1	1	1	1	1	3	3	5	5	7	7	7	7	10	10	10	10	9	9	8	8
Base laboratories, in hospital centers (included in next line)									1	1	1	2	2	5	7	11	14	16	17	17	11	9	9	8
Base hospital laboratories		1	5	7	7	8	9	13	14	15	19	20	25	33	47	57	84	87	112	112	82	66	47	45
Camp hospital laboratories						1	2	3	3	4	24	24	25	25	33	33	42	45	51	56	63	58	61	59
Evacuation hospital laboratories									3	3	3	4	8	8	8	12	23	25	37	37	24	20	9	18
Mobile hospital laboratories													1	2	3	5	7	10	12	13	3	5	4	1
American Red Cross hospital laboratories	3	3	3	3	3	3	3	3	3	3	4	4	4	8	15	18	18	19	19	19	14	12	9	8
Division laboratories									3	3	4	5	6	8	14	21	33	35	36	36	28	21	16	13
Total	3	4	9	11	11	13	15	20	30	32	60	63	77	92	128	154	218	232	278	284	224	192	155	153
Base hospitals with British	3	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	3	1	1	1

^a In this table Army Laboratory No. 1 is listed as a base section laboratory.

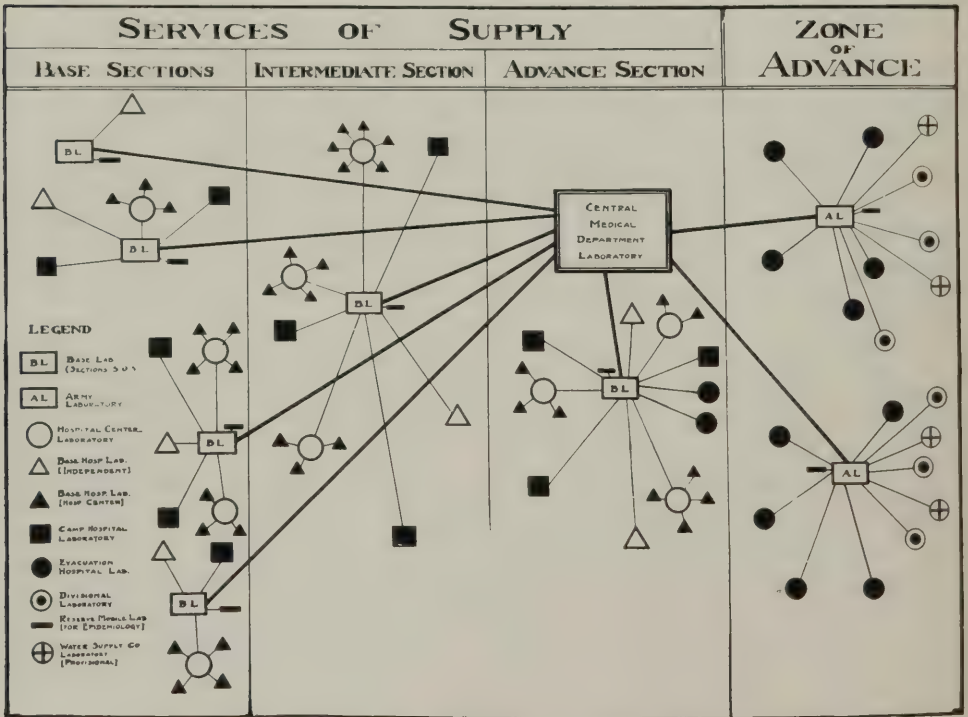


Fig. 8.—Diagram showing types of laboratories in the American Expeditionary Forces

INSPECTION OF LABORATORIES

In January, 1918, certain officers of the laboratory service made a hurried visit of inspection to the then existing centers of activity of the American Expeditionary Forces, in order to acquire first-hand knowledge of the laboratory personnel and equipment then available, to inspect available sites for the

establishment of base laboratories in the sections of the Services of Supply and to expedite the organization and development of those units.¹ This was the beginning of a system of general inspection which later was actively developed.¹ This inspection service was under the charge of the officer commanding the central laboratory, but it was quite impossible for him to cover more than a small part of this phase of the work alone and at the same time perform his other duties. When new areas were to be occupied by the American Expeditionary Forces or new projects were contemplated, that officer visited the area concerned and after consultation with its senior medical officer, made a survey of the general situation from the viewpoint of laboratory requirements, conferred concerning the latter's recommendation, and submitted a report to the director of laboratories covering the situation, with recommendations to meet it.¹ When the director, or other officer, returned from a trip of inspection a conference was held and verbal reports were made, followed by a written report that was circulated in the office of the director of the division.¹

This inspection service gave the director and his assistants an infinitely better conception of existing conditions than could have been obtained otherwise, resulted in a much higher degree of coordination in the laboratory service at large, and enabled the director on many occasions to make decisions of much greater value to the service than would have been possible had this system of inspection not been in force.¹

STATIONARY LABORATORIES

BASE LABORATORIES ASSIGNED TO SECTIONS OF THE SERVICES OF SUPPLY

In accordance with the original plan of organization one base laboratory was established for each section or other subdivision of the Services of Supply.¹ These units were under the direct control of the section surgeon and were located at the headquarters of each section, except that the laboratory for the intermediate section was at Tours, that for the advance section at Neufchateau, and that for base section No. 3, at Winchester, England. These base laboratories occupied permanent buildings and were completely equipped for general laboratory work, affording general and special laboratory facilities for troops in the section who were not served by other laboratories.¹

Their activities consisted of clinical examinations, general and special bacteriology, general and special serological work, the distribution of culture media, laboratory examinations of water supplies, the investigation of outbreaks of epidemic diseases and such other activities as the section surgeon deemed advisable.¹ They were established as rapidly as the necessity for them arose and personnel and equipment became available.¹ The first unit of this type, Army laboratory No. 1, was established as mentioned above, at Neufchateau, in September, 1917, and the last at Le Havre, in September, 1918, where it served Base Section No. 4. By that time a laboratory of this type was operating in each section or other subdivision of the Services of Supply.¹

In the original plan of organization for these units provision was made for the transportation necessary to carry out field surveys of water supplies, to investigate outbreaks of epidemic diseases and to forward therapeutic sera

emergencies, but the transportation problem in the American Expeditionary Forces was of such a nature that vehicles were not always available for the effective prosecution of these duties throughout the areas they sought to serve.¹

The following brief history of the base laboratory for Base Section No. 5 is illustrative, to a degree, of those of other sections of the Services of Supply.

BASE LABORATORY, BASE SECTION NO. 5

This laboratory was organized in February, 1918, under the title of stationary laboratory No. 2.² This occurred in Washington, D. C., where the various officers and men connected with it assembled and remained on duty until their departure for France, May 1, 1918. On arrival in France there were no available supplies for the laboratory, those originally shipped having failed to arrive, and substitutes were extremely difficult to procure. These defects, however, were gradually overcome.² Shortly after its arrival in this section the name of the laboratory was changed to base laboratory, base section No. 5, under which title it continued to operate.² It gradually developed into a concrete organization so staffed and equipped that practically any type of laboratory diagnosis or research could be performed.² Its greatest activities were the study and control of infectious diseases in base section No. 5.

About June 12, 1918, the base laboratory absorbed that of Camp Hospital No. 33, whose premises it occupied and enlarged to four rooms. Permanent fixtures were installed, but six weeks later, when other quarters became available, the base laboratory left this location, which was reoccupied by the laboratory of Camp Hospital No. 33.³ In August, 1918, the base laboratory was installed completely equipped in a house in Brest, formerly a private residence, but which lent itself well for the purposes.²

In the organization of this unit various departments were created, each in charge of the officer best qualified for that particular work. As far as possible these departments were kept strictly separated that their work might be unhampered by the necessity of their respective personnel undertaking other work for which they were less qualified.² The departments consisted of office and records, property, bacteriology, pathology and serology, chemistry, and water control. In the investigation of infectious diseases in this base section the laboratory was entirely dependent upon the activities of its own personnel to secure specimens for examination.² The respiratory infections which swept through base section No. 5 in the fall and winter of 1918 were studied by the bacteriological and pathological departments. Cultures were made from the sputum and the various organs at autopsy. All organisms secured were carefully typed and, when possible, preserved for future study. The bacteriological and pathological work done in common with these diseases was of an advanced and extremely thorough character. All this work was done under the direct supervision and at the direction of the base surgeon base section No. 5.

Complete liaison, both official and unofficial, existed between this organization, the local hospitals, and the Engineer Corps.² Most of the laboratory activities pertained to the service of these agencies. The chief association with the engineers related to the water supply of Brest, and that with hospitals to the control of infectious diseases.²

In addition to the duty indicated above this organization exercised a general control and supervision over the smaller laboratories attached to hospitals in and about Brest, and in a way served as a supply depot not only for laboratory material but also for therapeutic and diagnostic sera.² The therapeutic sera were secured by requisition, as were some of the diagnostic sera, but most of the former were prepared by the department of bacteriology connected with the base laboratory.² Hospitals in the vicinity were supplied sera on requisition by means of the light truck above mentioned. All trans-Atlantic transports requiring sera were supplied in like manner on telephonic request that was later confirmed in writing. Because of the fact that they were frequently demanded in emergencies, these supplies were sent out day or night, for the laboratory operated throughout the 24 hours of the day.²

A great handicap, which this laboratory experienced and which caused marked detriment to complete efficiency, was inadequate transportation.

After great difficulties this laboratory secured a light truck, which alone made it possible for its personnel to cover much ground and secure the specimens requested in connection with the control of infectious diseases.² The one vehicle permanently supplied was not sufficient to meet the demands, and the procurement of other transportation from the Motor Transportation Corps was very uncertain and inadequate. This feature caused much loss of valuable material and time. Another handicap was the fact that supplies were limited, for it was always difficult and sometimes impossible to obtain them.²

BASE LABORATORIES FOR HOSPITAL CENTERS, AND HOSPITAL LABORATORIES SERVING IN CENTERS

Plans for the organization of the laboratory service had considered the conservation of personnel, equipment, supplies, and construction, in order to release tonnage and to utilize resources to the best advantage.¹ In the laboratory service of the large hospital centers which were made up of several base hospital units great economies were thus effected. Each base hospital included in its personnel two or more commissioned laboratory officers, a varying number of enlisted technicians, and a complete laboratory equipment. By centralization of the laboratory service the efficiency was increased, personnel released, equipment conserved, and construction diminished.¹ Therefore, in each hospital center one base laboratory for the entire service of the center was organized and one small clinical laboratory established for each base hospital unit. The laboratory for the center was part of the headquarters organization, and its commanding officer the representative of the commanding officer of the center in all matters relating to the laboratory service. Its personnel consisted of selected officers and enlisted technicians drawn from the hospital units comprising the center; its equipment was drawn from the same sources.¹

Standard plans for the laboratory buildings for the centers and for smaller clinical laboratory buildings for each unit were prepared in the office of the director of laboratories, A. E. F., and turned over to the hospitalization division of the chief surgeon's office for inclusion in the general plans of construction.¹ The original plans provided for two standard barracks for the base laboratory and one small building for each hospital unit functioning in the center, but the

accommodations for the base laboratory were later reduced to one building because of scarcity of materials.¹

The base laboratory for the center in general performed such routine clinical and pathological work as might be necessary, all highly technical bacteriological and serological work for the center, and prepared culture media and special reagents, which it issued to the subsidiary clinical laboratories.¹ Those organizations operating in the several base hospital units composing the center carried on the clinico-pathologic work for their respective units.¹

The general method outlined above was that followed in the large hospital centers of temporary construction.⁴ In the large centers which utilized permanent buildings that were a considerable distance apart it was not always possible to centralize the work so definitely.⁴ However, by November, 1918, a laboratory service which conformed in general to the method outlined above had been established in all hospital centers operating in the American Expeditionary Forces.⁴

In those hospital centers where permanent buildings were utilized the laboratory services were housed in such rooms or buildings as were found most suitable for their purposes without extensive alterations.⁵ The laboratories, therefore, at these centers varied considerably in size and character, ranging in size, for example, from a temporary wooden building erected for laboratory work at the hospital center at Limoges to an entire hotel equipped for laboratory purposes at the hospital center at Vichy.⁵

At all the hospital centers except that at Vichy the laboratory work was organized in conformity with Memorandum No. 8, July 23, 1918, division of laboratories and infectious diseases.⁵ As this memorandum is reproduced in the appendix it is sufficient here to state that it provided for a laboratory officer who, as a member of the staff of the commanding officer of the center, would exercise control over its entire service, in so far as his specialty was concerned, and for the establishment of a center laboratory and unit laboratories.⁵ Each of the hospitals composing the center was to be served by a unit laboratory. The center laboratory was to perform such examinations as required greater time and more technical skill, while the unit laboratories were to perform ordinary routine clinical pathological examinations.⁵

In order to illustrate the laboratory activities at these centers there follows the history of that service at Mesves and at Vichy. The organization and activities of the laboratory service at Mesves, which grew to be the largest center in France, were typical of those in other centers,⁵ except Vichy. This service at Vichy is, therefore, described also because of its unique character.

TYPICAL LABORATORY ORGANIZATION OF A HOSPITAL CENTER (MESVES)

The first base hospital assigned to Mesves, arrived August 1, and on August 3, a laboratory officer for the center was assigned.⁶ Efforts were inaugurated and continued to provide accommodations, equipment and organization for the laboratories of base hospitals as they successively arrived. Construction was expedited, by loaning to these units a Medical Department tool chest, by which construction of much apparatus, shelving, furniture and other articles was expedited—apparently a minor matter, but one which proved of very

great importance. Supplies were procured on requisition from intermediate medical supply depot No. 3.⁶

In conformity with Memorandum No. 8, division of laboratories and infectious diseases, July 23, 1918, the laboratory organization for this center comprised (1) a central laboratory whose commanding officer was a member of the staff of the commanding officer of the center, and supervised all its laboratory activities; and (2) unit laboratories, viz, one for each of the hospitals composing the center and the convalescent camp. The work of these departments was divided as follows:⁶

Center laboratory: (a) Special pathology (gross and microscopic); (b) special bacteriology (pneumococcus type, typhoid, and dysentery); (c) Serology (agglutination and complement fixation reactions); (d) general board of health for center (water analysis, carrier work); (e) preparation of media, purchase and requisition of supplies).

Unit laboratories: (a) Gross pathology (autopsies on all patients dying in hospital); (b) bacteriology (general culture work, blood, throat, wound, etc.); (c) general clinical pathology (urine, sputum, blood, feces, etc.); (d) preparation of Dakin's solution, care of unit water supply, etc.

This partition of duties was inaugurated August 15, 1918, and continued unchanged, though in September it was apprehended that laboratory supplies available for incoming units might not be adequate for the performance of all the duties allotted them. Laboratory work, however, was simplified by the practice of distributing patients, according to their ailments, among the hospitals best equipped and otherwise qualified to care for them.⁶ The distribution of duties proved highly satisfactory, but a conviction grew that centralization of post-mortem service and burials might have been advantageous, although this would have deprived clinicians of opportunities to attend autopsies in which they were interested.⁶

The center laboratory, until September 17, occupied quarters in common with those of Base Hospital No. 67, when it moved to a special building provided for it. This was 100 by 20 feet in dimensions and was later supplemented by a cool room 6 feet by 6 feet 6 inches, and an animal house 13 by 26 feet. These buildings were occupied several weeks before they were equipped with light, water, or sewer connections.⁶

Each unit laboratory centrally located in the hospital which it served occupied a building 20 by 40 feet, divided originally into an autopsy room, a morgue, and a clinical laboratory, but several changes were made in the interior plan of these structures. Each laboratory built most of its interior fittings.⁶

All laboratory supplies reaching the center were invoiced to the center laboratory officer and by him issued on memorandum receipt to the unit laboratories. In connection with such supplies, many economies and improvisations proved necessary. The supplies most difficult to obtain were those commonly used articles not listed in Memorandum No. 21 from the division of laboratories and infectious diseases, e. g., stoves, books, basins, pens, wire, etc. Animals, except mice, were procured without difficulty.⁶

Records were kept in the following manner: Request slips were made out in the wards and on these slips laboratory findings were entered, the slips then

being returned to the wards. Retained laboratory records consisted of (1) a journal or daybook in which all specimens or requests were listed; (2) a file of index or ledger cards on which the reports mentioned above were transcribed. All the work done on a given case was entered on one or more of these cards. This system simplified clerical work and facilitated cooperation with the clinical services.⁶

General reports of infectious diseases were carried on spot maps and on separate card indices for the more important diseases—pneumonia, diphtheria, typhoid, dysentery, meningitis, and scarlet fever. These records were obtained from (1) the morning report of infectious diseases, (2) from individual reports of cases which were required by a special memorandum of the commanding officer of the center, and (3) from the medical consultant. Each case of diphtheria, meningitis, and typhoid fever was personally investigated by an officer from the center laboratory. Routine reports of water analyses were made to the center sanitary inspector and to each hospital. The locations of all Lyster bags were posted on spot maps, to facilitate checking the routine bacteriological examinations.⁶

The laboratory staffs of the entire center consisted of 29 officers, 7 nurses or civilians, who had had previous laboratory experience, and 63 enlisted men. Of this number 5 officers, 1 technician, and 15 enlisted men served at the center laboratory, while the others were distributed among 8 base hospitals, 2 provisional base hospitals, 2 evacuation hospitals, and the convalescent camp.⁶

The idea of developing the laboratory service from a central laboratory with subsidiary laboratories in each hospital organization proved practical and efficient. As each hospital occupied somewhat the same position in the center that the regiment held in a division, this organization, more than any other factor, simplified the development and operation of the laboratory service. The old and established functions of the laboratory proved of most value, but the preparation of Dakin's solution and the supervision of the water supply in each hospital by its laboratory, in addition to the regular bacteriological examinations of the camp water supply, were other valuable services. Wound bacteriology and pneumococcus typing proved of little practical importance.

With the exception of influenza and influenza pneumonia, there were no epidemics in this center. Diphtheria was the most prevalent of the carrier-borne diseases (151 cases), and the number of diphtheria carriers detected was correspondingly high (112 cases). The presence of diphtheria and of virulent diphtheria-like organisms in wounds was frequently noted. Twenty-six cases of cerebrospinal meningitis were treated, of which 12 died. Twenty-five of these cases developed in this center. Seventy-three cases of typhoid fever, one case of paratyphoid A, and two cases of paratyphoid B were treated, of which total, 21 were believed to have originated here. Thirty-eight of these cases were verified bacteriologically.⁶

THE LABORATORY SERVICE, HOSPITAL CENTER, VICHY

The organization of the laboratory service at the hospital center at Vichy differed from that in other centers because of the fact that it appeared advisable to centralize all laboratory personnel and equipment. This decision arose

from the fact that the hospitals comprising the center operated in some 80 hotels which varied in their capacity from 50 to 1,200 beds. Because of the consequent unevenness in the distribution of buildings and bed capacity, operation of unit laboratories would have been difficult. In one hotel, accommodating 1,200 beds, one small subsidiary laboratory was established but this was the only departure from this plan for centralization.⁵

The laboratory equipment of the five base hospitals at this center was, therefore, assembled at the center laboratory to which all Medical and Sanitary Corps officers belonging to the laboratory staffs of the various base hospitals were assigned. Enlisted men who had had previous experience as laboratory technicians, photographers, and artists from all organizations were similarly assigned.⁵

The laboratory and its enlisted personnel occupied an entire hotel with the exception of three small rooms which were assigned to the American Red Cross for office purposes.⁵

In this, as in other centers, an experienced laboratory officer who was assigned to the staff of the commanding officer of the center, organized and controlled its laboratory service, and was responsible for its activities.⁵

The laboratory staff here consisted of the following personnel:⁵ Medical officers, 9; Sanitary Corps officers, 2; civilian employees, 4; enlisted men, 35; French employees, 7; total, 57. This personnel was distributed among the following departments: Administrative, pathological (including clinical and neuropathological), bacteriological, serological, art, photographic, and preparation of media.⁵

The administrative department had charge of the laboratory building, its proper policing, discipline of the enlisted personnel, the cleaning of glassware, operation of stock rooms, collection of specimens, and the issue of laboratory reports.⁵

The assistant director of the laboratory took complete charge of any large bacteriological problems that arose, such as extensive investigations for diphtheria, meningitis, or typhoid carriers, and was authorized to detail as his assistants any subordinate member of the laboratory staff.⁵

So far as possible the laboratory staff of each of the five base hospitals composing this center performed the routine laboratory work of their respective hospitals; e. g., clinical pathology, wound bacteriology, etc. Therefore, the service for each base hospital was left in charge of its own pathologist who was responsible to the laboratory officer of the center through the assistant director of the laboratory.⁵

The pathological department had entire control of the autopsy service and of surgical pathology. The laboratory officer of each unit performed practically all the autopsies pertaining to it, but the brains and spinal cords were removed by the neuropathologists and their technicians. All patients dying at this center were autopsied, a stenographer taking the dictated protocol at the post-mortem table. Almost every autopsy included an examination of the brain, spinal cord, and accessory sinuses of the head.⁵ This department was able to prepare microscopic sections of the important viscera from most

of the autopsies, to study them, prepare microphotographs and, with the aid of the art and photographic departments, to make drawings of gross and microscopic lesions. Clinical pathological meetings which the entire medical staff of the center were requested to attend were held three times a week in the lecture room of the laboratory. At these sessions clinical histories of all cases coming to autopsy were read and discussed, the gross anatomic material was demonstrated, and microscopic sections, drawings, charts, etc., were exhibited.⁵



FIG. 9.—Pathological room in the laboratory, Vichy hospital center

Wassermann tests, the typing of pneumococci, weekly water analyses and such other procedures as required more or less routine work, were assigned to a few officers and men and the individual base hospitals' laboratory staff was thus relieved of these duties.⁵

Though serology was done by the department of that name there was always opportunity for the laboratory staff of each base hospital to perform any of this work, if they so desired and had the time.⁵

The art and photographic departments had charge of all the medical art work of the center. Reenforced by a special group sent from the United States, this department was engaged in taking photographs of clinical cases, making black and white drawings, and colored drawings of gunshot wounds,

mustard gas burns and peripheral nerve injuries. It also took photographs or made drawings of surgical specimens, autopsy lesions and constructed plaster or wax models of facial injuries and other lesions. When the armistice was signed, this department was prepared to furnish on request, medical photographs and artists to other hospitals. It was planned and to a large degree accomplished that this center be made a collecting point for medical art work in the American Expeditionary Forces.⁵

The basement of the hotel utilized for laboratory purposes, contained the morgue for the entire center with a central autopsy room. Another room on this floor used for the preparation of bacteriological media was equipped with hot and cold water, gas and electricity. In a third room were stored the coffins which were made by the Quartermaster Department while a fourth room was shelved and used for the storage of antitoxins, sera, vaccines, etc.⁵ Offices of the laboratory officer and his assistant and a small medical library were on the ground floor. Another room accommodated a large clinical and bacteriological laboratory which provided a desk bench for the pathologists and laboratory personnel of all the hospitals in the center. Most of the routine work was done in these rooms. On the same floor were a lecture room seating about 100 persons (also used for a museum and for the display of the work of the art and photographic departments) and a media and chemical supply room which served the entire laboratory.⁵

On the first floor were located the pathological, art, and photographic departments. These afforded facilities for officers engaged in histology and the preparation of gross pathological specimens for museum purposes, for artists engaged in medical art work, for a modeler of plaster and wax preparations for face masks, etc. Here were provided storage of pathological specimens for shipment to the Army Medical Museum, a portrait studio, and facilities for developing and mounting photographs. The brains removed from all cadavers were hardened, studied, and stored for shipment to the Army Medical Museum.⁵

The second and third floors of the hotel were used for living rooms for the laboratory personnel, about 40 being quartered there. All the rooms in this building were well equipped with water (hot and cold), gas, and electricity.⁵

The laboratory equipment and apparatus were excellent. Much of the equipment was brought to France by the several base hospitals, but additional articles were obtained from the medical supply depot and the central Medical Department laboratory. The equipment compared very favorably with that seen in most large civil institutions. An elaborate equipment for neuropathological work, consisting of large brain microtomes, etc., costing about \$18,000, was shipped to the center from the United States but was never received.⁵

The methods of procedure employed by the laboratory in the service of the scattered hospital establishments were comparable to those used by departments of health in a civil community supporting a diagnostic bacteriological laboratory.⁵

As glassware containers for the collection of specimens were quite limited, small stations supplying this material were established in the largest of the

hotels occupied by the several hospitals. These culture stations, as they were called, were usually located in the pharmacy of the building. At one time 22 of these stations were in operation, and at each the laboratory maintained an adequate supply of the containers for urine, feces, or sputum; diphtheria culture tubes, wound culture tubes, and "venereal outfits," the last mentioned consisting of glass slides and swabs for taking smears.⁵ From each station containers for the collection of specimens were distributed as required to smaller buildings and conversely here were collected specimens and requests for laboratory service.

Pasted on each container was a mimeographed blank for the entry thereon of appropriate data. Similar detached blanks were kept at the culture stations for use as requests upon the laboratory for special services.



FIG. 10.—Bacteriological laboratory, Vichy hospital center

In an emergency, e. g., a blood transfusion, or a leucocyte count in an appendicitis case, there quest was sent direct to the laboratory by an orderly, and delivered to the pathologist of the hospital in which the soldier was a patient. This officer was responsible for an immediate laboratory examination. None of the Army forms or blanks were employed in the laboratory service here.⁵

Three enlisted men, who acted as culture collectors, visited each of the culture stations three times daily, employing a motor cycle and side car.⁵

All specimens brought to the laboratory by the culture collectors or sent direct by a hospital were noted in numerical sequence on an entry book at the

receiving office. The specimens were then distributed for examination and the results of these examinations were noted upon report blanks, the laboratory retaining a carbon copy for its file, the original copy being sent to the hospital and ward from which the specimen came or for which the examination was made.⁵

Though the laboratory at Vichy existed for a year, it operated actively only for five months. During this time, 44,767 laboratory examinations were made, including practically all the common tests, reactions, and procedures required by modern clinical medicine in bacteriology, serology, clinical pathology and pathological anatomy.⁵

BASE HOSPITAL LABORATORIES FOR BASE HOSPITALS NOT OPERATING IN CENTERS

The laboratories of detached base hospitals performed all routine clinical and pathological work for the organization they served. Their installation was a matter of local administration and their operation presented no difficulties.⁷

Many of the following details, taken from the history of the laboratory activities of Base Hospital No. 27, are illustrative of the activities of those establishments in detached base hospitals generally. This unit was selected for discussion here because of the completeness of its history.⁷

The staff of the laboratory originally consisted of 3 medical officers, 1 trained nurse, and 3 enlisted men. One officer was engaged in pathology, another in bacteriology, and the third (who gave part of his time to ward work) in clinical microscopy, parasitology, and chemistry. Late in November, 1918, a Sanitary Corps officer joined the staff, but at intervals one or more officers were detached for periods of three months or less. The services of civilian photographer and artist were made available to this unit and thus some valuable material in this field of endeavor was procured.⁷

The laboratory of Base Hospital No. 27, which was located at Angers, first occupied two rooms in a permanent building. Since these rooms were overcrowded, a temporary structure was obtained into which the laboratory moved as soon as the new building was completed. This building was centrally located and was of the wooden barrack type, with cement floor and plaster walls. The floor plan included two workrooms, measuring 6 by 12 meters, with an incubator room 2.5 by 2 meters and a storeroom 2 by 2 meters between them, one on either side of a short passage connecting the two large rooms.⁷ The workrooms contained benches, along both sides, and center tables. Large sinks, supplied with hot water and adapted to cleaning glassware, etc., were provided for each room, and a sufficient number of small sinks for the side or center tables. Both rooms were wired for electricity, with numerous ceiling and side lights and a number of floor plugs at the sides of the room. Ample shelf space was provided, the storeroom being shelved to the ceiling. Gas connections were installed along all the side tables. A hot-air sterilizer, a paraffin oven, and a large centrifuge were operated in the incubator room, and the Arnold sterilizer and the autoclave in the bacteriological room. As far as possible, the reserve supply of laboratory materials was kept in the storeroom.⁷

When the temporary structure was occupied, the rooms whence the laboratory moved were thoroughly equipped as a morgue and as a fixation room for specimens.⁷

The equipment originally brought to France was that estimated on the basis of the needs of a 500-bed hospital for one year, but when the bed capacity was doubled (or counting emergency beds, quadrupled), a requisition was submitted for corresponding additions to equipment. Availability of gas and electricity secured the issue of apparatus not considered in the original list of equipment.⁷

Arrangements for the delivery of specimens to the laboratory were left to the respective ward surgeons, but phenolphthalein tests, diagnostic lumbar punctures, procurement of specimens for Wassermann tests, blood cultures, and blood counts were all attended to on request to the laboratory staff.⁷ Each specimen was accompanied by a requisition slip upon which the reports desired were entered and was returned to the proper ward by the laboratory personnel. Laboratory records were kept for the most part in separate ledgers, one for each class of work, e. g., blood counts, urine analysis, etc., but general bacteriological findings were recorded in one book and wound bacteriology findings in another, each in numerical sequence. Record of examinations of surgical pathological tissues were entered on the original requests for examination. These were retained at the laboratory and duplicates of the findings noted were sent to the wards. Autopsy records were made on appropriate forms with histological notes appended when necessary to make the diagnosis complete. Wassermann tests were recorded on cards, each day's list being entered on a separate card.⁷

The chief activities of the laboratory were clinical pathology, anatomic pathology and clinical bacteriology. A considerable part of the bacteriological work was incidental to the epidemiological study of cultures from this and other hospitals in the vicinity of Angers.⁷ The laboratory also made the water analysis for this region.

The somewhat limited official personnel and lack of trained technicians necessitated such close cooperation and application to the routine work in hand that research work was precluded.⁷

CAMP HOSPITAL LABORATORIES

Effort was made to furnish each camp hospital with laboratory service in accordance with its requirements.⁴ This was not entirely uniform, for these hospitals varied greatly in size and in the nature of their service. Some functioned as base hospitals; others were little more than evacuating infirmaries, or varied between these two extremes. In November, 1918, 58 camp hospitals were operating with the American Expeditionary Forces and there is record of laboratory service in 51 of these.

The following notes from the history of the laboratory of Camp Hospital No. 15, exemplified to a degree the activities of these units.⁸ This hospital was organized in France from casual personnel. Its capacity was 700 beds, expandable to 1,000 beds in emergency. Located at Camp Coetquidan, which accommodated 20,000 troops, the hospital began to admit patients November 1, 1917.⁸

The laboratory staff consisted of one officer and four enlisted men. At first equipment was very limited but was augmented from time to time as resources permitted by American and French apparatus. The laboratory occupied two rooms, with floor areas of 50 and 25 square meters respectively, in a centrally located permanent building and utilized rooms in a neighboring structure as a morgue and an animal house.⁸

Requests for examinations as well as specimens were sent to the laboratory by ward surgeons. Findings were recorded in note books and reports then rendered the ward officers. Requests from officers outside the hospital were sent through the receiving ward, and reports returned through the same channel.⁸

An important part of the laboratory service was the periodic examination of water supplies in villages where troops were located throughout the surrounding territory, and sanitary surveys, with studies pertaining to epidemiology among the troops occupying the area. As meningococci were discovered in the course of the influenza epidemic at Camp Coetquidan, approximately 8,000 cultures for these organisms were examined, of which 662 were positive. Because of limited equipment, chemical examinations were few.⁸

MOBILE LABORATORIES

ARMY LABORATORIES

In the original plan of organization, a laboratory unit for each army was provided, but it was thought best to await developments before the project was further defined.¹ Until July, 1918, all laboratory investigations of outbreaks of epidemic diseases in the advance section and zone of the armies were performed by personnel and motorized laboratories—i. e., “field laboratory cars”—sent out by the central Medical Department laboratory or Army laboratory No. 1.¹ During the Chateau-Thierry operation, a field laboratory car was attached to the First Corps for the investigation of epidemic diseases and it was understood by the chief surgeon of the Paris group, of which that corps then formed a part, that this car was available for the service of the entire group. The work of this unit in the Chateau Thierry sector proved to be of great value, for it demonstrated that much of the so-called diarrhea and dysentery occurring there was true bacillary dysentery, typhoid or paratyphoid.¹

In August, 1918, it became evident that there should be attached to each army a laboratory unit equipped to do general bacteriology, serology and examination of water supplies.¹ A transportable laboratory equipment for service of the first army was assembled and shipped to Toul just prior to the St. Mihiel operation (September 12, 1918). As special personnel was not immediately available, the equipment was installed at the Toul hospital center where the laboratory served the center and also met the emergency requirements of the First Army.¹

During the early phases of the Meuse-Argonne operation, a field laboratory car was attached to the First Corps of the First Army.¹

When the Second Army was formed, a field laboratory car was attached to the office of the surgeon of that army. It operated under the sanitary inspector, Second Army, in the investigation of epidemic diseases.

When the Third Army was organized to constitute the Army of Occupation in Germany, a survey of the laboratory requirements was made and the personnel and equipment necessary for its service were supplied.⁹ Army laboratories were established at Coblenz and at Trier, that at Coblenz being supplemented by a mobile laboratory.⁹

The laboratory service of the Third Army illustrates the full development of this specialty in this field. On March 16, 1919, it included 2 army laboratories, 10 hospital laboratories with 2 annexes, and 8 divisional laboratories; i. e., 1 for each division.⁹

The army laboratories were staffed and equipped to perform all the ordinary duties of laboratories serving large cities or even States. The personnel of the unit located at Coblenz consisted of 10 officers and 24 enlisted men, excluding those assigned to the field laboratory car which also served this army and which was attached to this unit.⁹ It included a commanding officer, executive and supply officers (one officer sometimes discharging the duties of both assignments) a pathologist and histologist, bacteriologist, water analyst, serologist, chemist (with exceptionally broad attainments, especially in the field of toxicology), three clinical laboratory experts, and a skilled technician.⁹ At the army laboratories autopsies were performed, histologic diagnoses and Wassermann tests made, bacteriologic differentiations conducted, water samples tested and chemical analyses made of food, beverages, medicines and supplies, e. g., chlorinating materials for water purification.⁹ Each of these units also conducted a clinical laboratory service for the hospital wherein it was located and issued supplies to other laboratories in their respective areas. The laboratory at Coblenz performed the usual laboratory service for Evacuation Hospital No. 27 (formerly No. 6) and sent out officers to conduct autopsies at other hospitals.⁹

Attached to the Third Army laboratory at Coblenz was a field laboratory car which was staffed by one officer and three enlisted men. This unit was of especial value during the initial emergency and in the prosecution of surveys of meningococcus carriers.⁹

The army laboratory at Trier occupied space in Evacuation Hospital No. 12, for which it performed all the clinical laboratory service in addition to its other duties, which were similar to those outlined above for the laboratory at Coblenz.⁹

Ten laboratories each adequately equipped with material packed in eight chests, served the 10 evacuation hospitals, which in the Third Army served as base hospitals.⁹ These hospitals varied in capacity from 400 to 1,800 beds and in the character of the cases treated. In some units the cases were almost entirely medical, in others many cases were surgical; a few units were largely devoted to the specialties. The laboratory service in each of these hospitals naturally conformed to the character of the patients treated therein. In very general terms this service included examination of urine, sputum, blood, cerebrospinal fluid, feces, and the bacteriology of wounds, epidemics, venereal, cutaneous, and ocular diseases, i. e., the usual lines of investigation connected with hospitals.

The staffs of some laboratories also performed autopsies for the hospitals which were not thus served by the army laboratories.⁹

No laboratories, other than the eight assigned to divisions, were provided for the field hospitals, of which 35 were in operation. These divisional laboratories, each provided with 8-chest equipment, were utilized to make water analyses, epidemiological studies and urgent clinical laboratory examinations.⁹

FIELD LABORATORY CARS

Each of the field laboratory cars, which on occasion reenforced the laboratory service of armies, was essentially a completely equipped unit, relying on



FIG. 11.—Field laboratory car

its own motor power, but was supplemented by additional transportation consisting of a Ford car and a motor cycle with side car.¹⁰ The unit could be shifted and moved rapidly to meet varying conditions in the field as well as to cover a large territory and was independent of field, evacuation, and base hospitals. The additional transportation permitted sanitary surveys covering a large area and facilitated the collection of specimens for examinations.¹⁰ Three of the cars were the Peerless type and one a De Dion Bouton. They were specially designed and equipped to meet field conditions, for oftentimes the laboratory would work in a division removed from hospitals and other laboratories.¹⁰

The equipment was compact and provided with a work bench and compartments for the apparatus and supplies. The arrangement made work in the car possible and prevented breakage while the car was being moved. The provisions made for actually doing work in the car constituted one of its greatest

advantages, but usually a room in some building was utilized for making media, washing glassware, and for a storeroom. Occasionally one was fortunate enough to be located where the apparatus could be set up in a separate room.¹⁰

The equipment consisted of incubators, autoclave, hot air sterilizer, distilling apparatus, ice chest, water bath, Wassermann outfit, centrifuge, microscope, hemocytometer, water testing outfit, material for spinal punctures, blood cultures and the usual laboratory accessories. A storage battery and generator, connected with the motor, provided electric lights. This was of great help, for often it was necessary that work be done in the car at night. This apparatus also gave excellent illumination for microscopical examinations.¹⁰ A gravity water system was provided, consisting of a water tank fastened on the roof of



FIG. 12.—Front of interior of field laboratory car

the car and connected with a faucet. A sink drain was also provided. Supplies were carried in the car to make the necessary media, a complete supply of diagnostic as well as therapeutic sera, and reagents for the Wassermann test. The equipment made possible the performance of the following laboratory tests:¹⁰ Routine clinical examinations, such as those of urine, blood, sputum, smears and body fluids; examinations for typhoid, dysentery, and enteric ailments generally; examination to determine positive diagnosis of meningitis and examination for carriers; examinations for diphtheria cases and carriers, and performance of Schick tests; investigation of respiratory epidemics, especially pneumonia and influenza; water analyses, bacteriological; Wassermann fixation test. These laboratories were not called upon however, for this work.

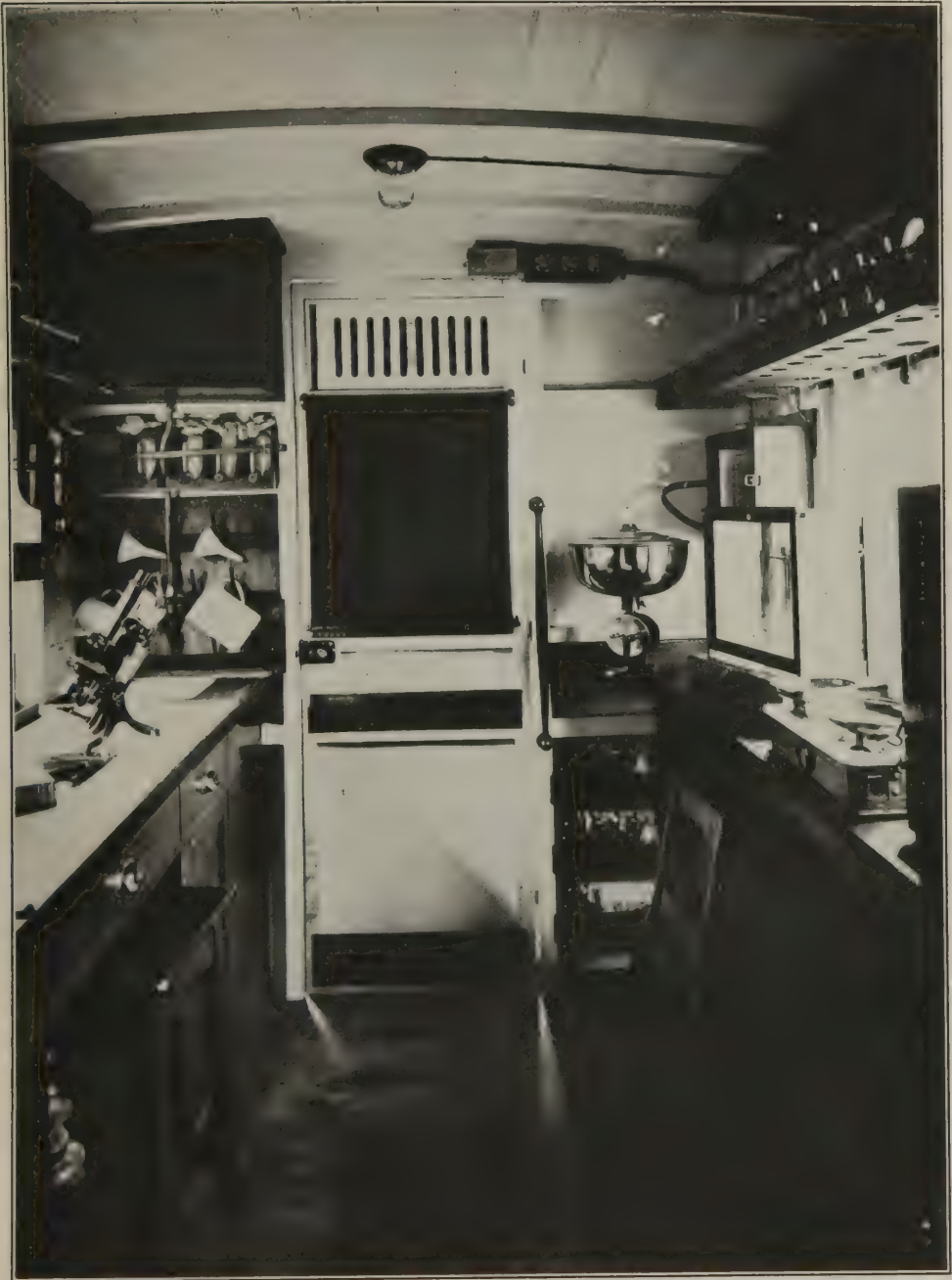


FIG. 13.—Rear of interior of field laboratory car



FIG. 14.—Interior of field laboratory car showing water still, autoclave, and sterilizers

The field laboratory car aided the sanitary inspector of an army to cope with epidemiological problems and it was in this capacity that it was of greatest use, though it was often called upon to assist in establishing clinical diagnoses.¹⁰ Being attached to army headquarters under the immediate supervision of the sanitary inspector, reports of its findings were made to him direct. The peculiar value of the laboratory cars rose from the fact that the divisional laboratories usually were unable to handle the larger epidemics and sanitary surveys, while performing their normal duties. The stationary laboratories were not provided with transportation for extensive field work though the collection of samples was of the greatest importance, while the excellent transportation facilities of the laboratory cars enabled them to reach sites where their services were needed and to carry supplies adequate for several months. These supplies usually were replenished from evacuation and base hospitals.¹⁰

The personnel consisted of 1 or 2 officers, 2 technicians (preferably sergeants or sergeants, first class), and 2 chauffeurs.¹⁰

These laboratories aided greatly in the investigation and control of typhoid fever in the 77th and 79th Divisions; meningitis in the 7th and 90th Divisions; diphtheria in the 32d and 35th Divisions; pneumonia and influenza in the 26th Division and in the labor battalion at Jonchery.¹⁰

The most important advantages which these laboratory cars presented were the following:¹⁰ The unit could function anywhere in the field, requiring no special housing or additional equipment and could, therefore, operate in any area occupied by the troops. It was supplied with its own light and water systems. Being supplied with its own motor power it was ready for immediate service and the transportation could not be diverted for other use, thus ensuring a mobile organization. The unit was able to handle large epidemics and to cooperate with the army sanitary officer in solving special problems and making surveys. It thus permitted other laboratories and those with divisions to continue their normal duties without interruption. On the other hand, the chief disadvantages of a field laboratory car were, the initial cost of the car and its special equipment, which was about \$7,500; the car being of special design, could be manufactured only in limited numbers, and in case of motor trouble the whole organization was unable to function.¹⁰

EVACUATION AND MOBILE HOSPITAL LABORATORIES

The laboratory equipment for each evacuation and mobile hospital was assembled in eight chests which could be packed and unpacked quickly and could be easily transported.⁴ It was adequate for all types of clinical and general bacteriological work, for the performance of autopsies, and the collection and preservation of museum specimens. As a rule, only one laboratory officer and two technicians were assigned to the laboratory units which served hospitals under consideration though a larger personnel originally had been contemplated.⁴ The personnel prior to assignment was given a special course of instruction in wound bacteriology. It was planned that these units would perform clinical pathology and autopsies as well as general and wound bacteriology and collect and preserve museum specimens, and work of this general character was per-

formed at those evacuation and mobile hospitals which were partially immobilized and operating in quiet sectors, but after July, 1918, when a war of movement began, the activities of many of these units necessarily changed.⁴

During 1918, the number of evacuation hospitals, each of which was equipped with a laboratory, increased as follows, until the time of the armistice: March, 1; April, 2; May, 2; June, 4; July, 8; August, 8; September, 13; October, 18; November, 18.¹¹

The first evacuation hospital (No. 1) was established near Toul in March, 1918, where it operated throughout the remainder of the war.¹¹ Except during periods of active military operations its services were to a degree comparable

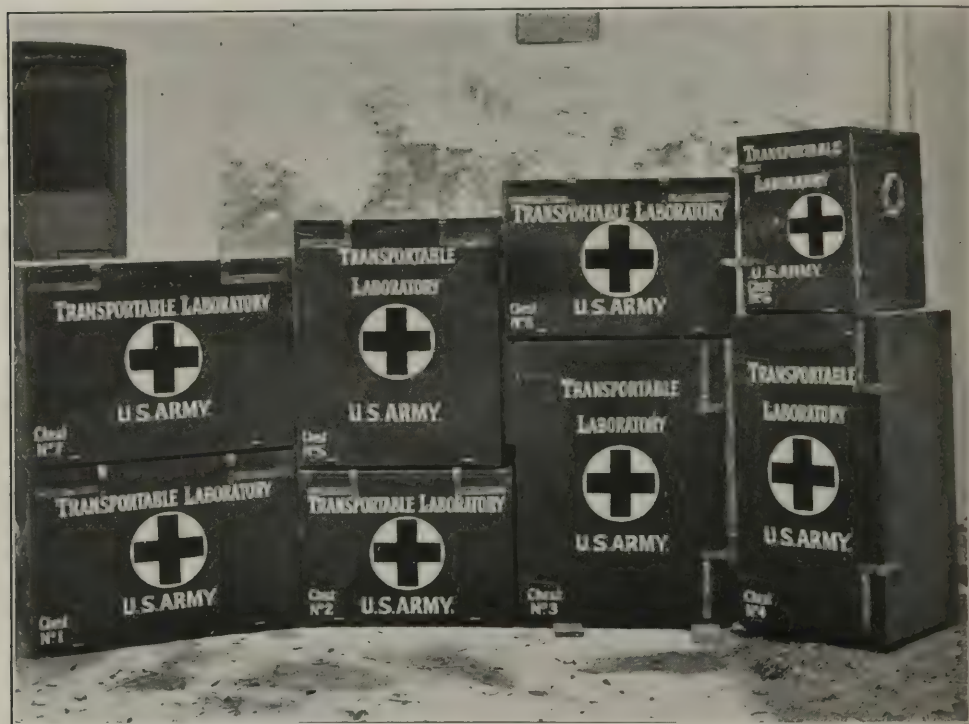


FIG. 15.—Transportable laboratory, in eight chests

to those of a base hospital, but during active engagements they were of the character which its name indicated. As at all times it was almost exclusively a surgical hospital, its chief laboratory activities were wound bacteriology and post-mortem pathology. Similarly, Evacuation Hospital No. 2, established in April, at Baccarat, was engaged chiefly in the treatment of battle casualties and its laboratory during that period was occupied in corresponding service.¹¹

Wound bacteriology occupied intensively the laboratories of evacuation hospitals during the period from July, 1918, to the armistice; but during periods of greatest battle activity, laboratory officers often were detailed to assist in the treatment of patients.¹¹ After the onset of the influenza epidemic in October, 1918, the laboratories were engaged also in the study of infectious diseases and frequently made the diagnoses for the ward surgeons. Post-

mortem examinations which they conducted on all bodies acted as a check against gross errors and furnished clinicians with invaluable information. Autopsies and histological and bacteriological examinations of specimens were made the occasion of clinico-pathological conferences.

During the Meuse-Argonne operation some of the evacuation hospitals were specialized to a degree, a number of them receiving medical cases and a number of others surgical.¹¹ Their laboratories supplied information required for diagnosis and treatment and for the prevention of the wider spread of infectious diseases. In general terms the equipment of these laboratories was very satisfactory.¹¹



FIG. 16.—Chests of transportable laboratory opened to show contents

When American troops took over their sector in occupied Germany this was divided into two districts, that of Coblenz and that of Trier. Seven evacuation hospitals served the six divisions in the Coblenz or Bridgehead district, and two, the two divisions in the district of Trier. Since these units operated as advanced base hospitals and some of them specialized on certain types of cases, the activities of their respective laboratories were modified accordingly. The laboratories in each district were supplemented by an army laboratory which conducted the more highly technical examinations in bacteriology, chemistry, pathology and serology.¹¹ The personnel of the army laboratories also performed the duties of consultants in special problems, especially surgical pathology, conducted depots of laboratory supplies and apparatus and performed autopsies for the hospitals in their vicinity.



FIG. 17

With a few isolated exceptions the work of the laboratories in the evacuation hospitals would have compared favorably with that in the average civilian general hospital, for in spite of the deterrent influences of campaign they proved their utility—in fact their indispensability.¹¹ The laboratories proved to be of immediate clinical value in both medicine and surgery and collected a number of specimens for the Army Medical Museum.¹¹

The laboratories of mobile hospitals were especially engaged in wound bacteriology, for these units were organized to receive the nontransportable wounded.¹² They made, however, a number of examinations in other fields, as blood and throat cultures, differential blood counts, examinations of joint,



FIG. 18

spinal, and chest fluids, of blood, sputum, urine, urethral smears, and feces.¹³ Serum for Wassermann tests was collected and sent to designated laboratories. Autopsies were performed and museum specimens collected.¹³

Some of these laboratories moved quite frequently, that with Mobile Hospital No. 1, for example, changed station nine times in five months.¹² Some used tentage but when possible a room in a permanent or temporary building was employed. The equipment issued was found to be ample. Many technical expedients were employed in the effort to expedite reports to the attending surgeon.¹²

DIVISIONAL LABORATORIES

A laboratory attached to each division was staffed by two officers and four technicians,⁴ who constituted a part of the staff of the division surgeon.

In close cooperation with the division sanitary inspector, these units were engaged chiefly in control of epidemic diseases, in the inspection of water supplies, and supervision and control of water purification.⁴ In effect they were under the control of the sanitary inspector. The equipment issued these units was packed in three chests and was not adequate for general bacteriology, for it was planned that work pertaining to that specialty would be performed in the laboratories of evacuation and mobile hospitals.⁴ Such material as was furnished for work of that character was adequate only for the performance of routine clinical examinations.⁴

After the armistice began, when divisions went into training areas, many of these laboratories requisitioned and procured additional chests to complete



FIG. 19

equipment adequate for general laboratory work, including general bacteriology.¹ All the divisional laboratory units with the Third Army were supplied with complete transportable laboratory equipments, in eight chests each, thus permitting general bacteriological and clinico-pathological work.¹

On July 7, 1918, in Memorandum No. 5, division of laboratories and infectious diseases, the personnel, transportation, and duties of the divisional laboratory unit were prescribed in some detail.¹ The provisions of this circular were later republished and somewhat amplified, in Memoranda Nos. 5 and 7 from the same office ¹ (see Appendix).

These units usually were located at division headquarters, especially when the division was in a rest or training area or at headquarters of the sanitary train. In trench warfare or in training or rest areas the divisional laboratories

usually occupied two rooms in some building, preferably where heat, light, and water were available. During battle, as a rule, they were from five to seven miles behind the front, often in open fields, by the roadside, in tents, dugouts or unused buildings.¹⁴ Under combat conditions it was found expedient to divide the laboratory, the bacteriologist and sufficient personnel being located with the bulk of the laboratory equipment at one of the field hospitals, preferably the surgical hospital or one used for evacuation purposes.¹⁴ This part of the laboratory supervised the preparation of Dakin's solution and dichloramin-T and performed general bacteriological and pathological services. The other part, with the water supply officer and two enlisted men with the necessary



FIG. 20.—Showing preparations for shipping portable laboratories from the central Medical Department laboratory, Dijon

equipment, tested for poisons the water supplies in advanced positions, selected water points, and examined treated water for free chlorine.¹⁴ Facts learned by this party were promptly reported to the water-supply engineers, who then supplied the personnel and equipment necessary to produce a satisfactory drinking water. The water supply officer was charged with purification of this water if necessary and with successive checks upon it. Chemical analyses that required the use of standard solutions presented difficulties that could hardly be overcome in the field, but it was found expedient to test all water sources for poison during advances. This was readily feasible.¹⁴

Also in training or rest areas the laboratory cooperated in the location of water sources, determined the quality of their outflow, and performed the chemical and bacteriological tests incident to the control of water service.¹⁴

No hard and fast rule could be laid down for methods of procedure in rest areas, trench or open warfare. Methods in one field were not applicable in another, but when the division was engaged in trench warfare they were similar to those followed when in a rest or training area. Under the latter circumstances as much work as possible was placed on a routine basis.¹⁴

Whether at the front or in training or rest area the value of these units was clearly demonstrated, for they very materially strengthened the service of the sanitary inspector. A case of suspected epidemic disease arising in a regiment was immediately reported to the division surgeon and was sent to a field hospital where cultures were taken and forwarded by courier to the laboratory.¹⁴ If a diphtheria culture was found positive, contacts also were examined within two hours. The usual routine work arising in field hospitals was handled very readily by a courier service.¹⁴

The success of laboratory activities was commensurate with the ability of the unit to maintain close contact with the division surgeon and sanitary inspector, to adapt itself to field conditions, and to make the most of the limited facilities at hand.¹⁴

While some of these units did admirable work and were considered indispensable by some division surgeons, a large percentage were unable to function properly under combat conditions. The principal reason for this failure was lack of transportation. These laboratories had been included in the tentative tables of organization formulated for the American Expeditionary Forces, and adopted in August, 1917, but no transportation had been provided for them at that time.¹ For some reason, unknown to the division of laboratories, they were incorporated in the priority shipment schedule as "mobile laboratories" and as Services of Supply units.¹ Several efforts were made to secure transportation for these formations, and the inclusion of the personnel and their transportation as divisional units was recommended by the director of laboratories in the proposed revision of the Tables of Organization, when these were under consideration during the summer of 1918. This proposed revision had not been approved on the date of the declaration of the armistice.¹ Had even a motor cycle been available for each of these laboratories there is but little doubt that water discipline would have been better throughout the division, with a consequent decrease in the prevalence of typhoid and paratyphoid fevers and dysentery.¹ Lack of transportation in a number of cases caused the elimination of these laboratories as divisional units.¹⁴

In January, 1919, on special request of the division of laboratories, G-4, general headquarters, directed that one motor cycle with side car be issued to the divisional laboratory of each division still in France. This transportation permitted much closer and more satisfactory supervision of chlorination of water supplies in divisional areas.¹

TECHNICAL WORK OF LABORATORIES

Many types of technical laboratory work (e. g., gastric analyses, tumor diagnoses, etc.) of peace time had little place in the laboratory service of the American Expeditionary Forces. Instead of these, large numbers of examinations of relatively few ordinary types prevailed, with occasionally a highly specialized study to meet an emergency.⁴

The officer in charge of a laboratory assisted the attending medical officer and the surgeon by making urinalyses, blood-cell examinations, etc., and by determining the types of bacteria in wounds.⁴ His work was final in the diagnosis of many infectious diseases, and for the specific prevention and treatment of these he cooperated in the administration of vaccines, therapeutic sera, salvarsan, etc. He was consultant to the epidemiologist concerning the essential cause of a prevailing disease, the identification of immune carriers, and the character and extent of water pollutions.⁴ He inspected in large part the chlorination work of the water-supply service and in some measure the professional work of attending medical officers by determining at autopsy any error in diagnosis or treatment.⁴

The technical work of the laboratory section of the division of laboratories was so modified by the stages of development in its organization, by the incidence of epidemics and by active military operations that its history, for present purposes, is divided roughly into four periods: (a) From the first landing of troops, June 10, 1917, to November 30, 1917. Toward the latter part of this period a large number of cases of pneumonia developed. (b) From December 1, 1917, to May 31, 1918. It was during this period that activities of the hospitals of the American Expeditionary Forces began to be actively concerned with battle casualties. (c) From June 1, 1918, to November 30, 1918, the period of serious epidemics and of greatest battle activity, during which time the laboratories generally were concerned largely with enteric disease, influenza, and wounds. (d) The period of demobilization after December 1, 1918.¹⁵

The first period, that from June 10, 1917, to November 30, 1917, was one of tentative organization when the laboratories were engaged chiefly with the clinical pathology and bacteriology incident to ordinary illness and to accidents in a small body of troops in the services of supply or in training.¹⁵

On August 28, 1917, the director of laboratories submitted to the chief surgeon, A. E. F., certain suggestions concerning autopsies, the rendition of autopsy protocols, and the scope of the latter, and recommended that a bulletin concerning these matters be issued from the chief surgeon's office.¹⁶ The Wassermann service was begun in September, 1917.¹⁵ In the few laboratories then operating (4 camp hospital laboratories, 8 base hospital laboratories, and 2 section laboratories) a small but important autopsy service was begun.¹⁵ Very meager data concerning the technical laboratory work of this period are available, since no monthly reports were made.¹⁵

In the second period, from December 1, 1917, to May 31, 1918, additional laboratories in 12 camp hospitals, 3 evacuation hospitals, and 10 base hospitals, as well as the central Medical Department laboratory began to function, and the organization of the division of laboratories and infectious diseases was completed, thus greatly increasing the facilities for all types of technical work.¹⁵ Early in this period epidemics of pneumonia, diphtheria, scarlet fever, and meningitis among our troops taxed these facilities to their full capacity for routine clinical and bacteriological examinations.¹⁵ At the end of this period the system of monthly laboratory reports was begun, but the available information for most of the period was quite incomplete.¹⁵

When the German offensive of May 28, 1918, in the Marne area brought relatively great numbers of American wounded into our hospitals, the Medical Department was still very greatly undermanned in its laboratory as well as in its other services.¹⁵ So great was the need for medical attention that in many organizations all laboratory officers were diverted from laboratory work to the more direct care of the wounded. From this time until the signing of the armistice, laboratory officers were never available in half the number necessary to make the routine technical examinations, while research was, in general, wholly out of the question.¹⁵ However, laboratory officers succeeded in organizing and developing their laboratories, in doing most of the absolutely essential clinico-pathologic work, and in meeting emergencies, such as the performance of large numbers of bacteriological examinations and of autopsies incident either to battle casualties or to epidemics of enteric diseases, influenza, diphtheria, meningitis, etc.¹⁵ Until the 8-chest transportable laboratory units became available, the laboratory work was accomplished with equipment relatively so inadequate that the results obtained would have been considered practically impossible by laboratory personnel prior to the war.¹⁵ By November 1 the total number of laboratories in operation had greatly increased, as shown by Table 4, the personnel was advantageously distributed, and officers had learned to virtually "make bricks without straw." This third period of the laboratory activities of the American Expeditionary Forces—i. e., from June 1, 1918, to November 30, 1918—stands out preeminently as an index of how much may be done under most difficult conditions.¹⁵

The available information concerning the technical work for this period is fairly good. In May, 1918, a standard form (No. 5) for laboratory reports to the director of the division of laboratories had been devised and after June, 1918, this report was received monthly from most of the laboratories in operation in the American Expeditionary Forces. In October, 1918, this form was revised and improved.¹⁵ This monthly report, which was intended primarily to supplement the direct supervision from the office of the director of the division of laboratories, presented sufficient clinical information, concerning the activities of the hospital under "data for comparison," to enable the reviewer to determine something of the character and amount of work which should have been done by the laboratory and the personnel available for its accomplishment.¹⁵ Activities were divided into six groups among the personnel of the laboratory. All attempts to determine the clinical incidence, as of infectious diseases, were purposely omitted since it was believed that these more properly belonged to special reports of the section of infectious diseases and other agencies. The number of "positive" examinations in certain diseases was given merely to aid the reviewer in determining whether the clinician was underusing or overusing the laboratory.¹⁵ For example, a very high percentage of "positives" usually indicated underuse and a very low percentage suggested overuse. The careful review of each report immediately upon its receipt, and, if necessary, its return with a critical indorsement thereon, did much to improve the weak points in the service of some laboratories.¹⁵

The signing of the armistice marked the beginning of the fourth period of activity of the laboratory service. Many of its officers who had entered from

civil life requested orders for their return to the United States.¹⁵ These requests could not well be refused, though the quota of laboratory personnel was still far below that of any other branch of the medical service.¹⁵ The situation was aggravated by the fact that at this very time the appearance of typhoid fever in a number of organizations rendered necessary extensive bacteriologic examinations; thorough examinations for venereal disease were being conducted among troops in training areas, and potential danger points, which demanded increases of local laboratory service, were created by the concentration of troops in embarkation camps and at base ports.¹⁵ Because of decreased personnel and of the increased service demanded, much of the technical service of the laboratory division even in this final period was performed under stress. Fortunately, however, early in this period the receipt and distribution of laboratory supplies had been greatly expedited and this fact, coupled with the transfer of material from organizations being demobilized, greatly improved the physical conditions under which the service was rendered.¹⁵

As was inevitable, not all hospitals in the American Expeditionary Forces were staffed by attending medical or surgical officers well trained in the selection of cases in which clinico-pathologic examinations might be of assistance; nor were they all sufficiently trained in interpreting the results of these examinations. In some instances serious diagnostic errors were made which might have been prevented by even a urinalysis; in others the laboratory was called upon to make large numbers of difficult examinations in a search for the specific cause of a disease which was scarcely even suggested by the symptoms.¹⁵ Personal supervision by medical and surgical consultants did much to improve the clinical services in this respect but this was obviously inadequate to cover with sufficient detail the activities of several hundred hospitals. In hospital centers the assignment of the laboratory officer of the center to the headquarters staff greatly increased the efficiency of the laboratory service of the center and promoted its coordination with the other professional services.¹⁵

THE CLINICO-PATHOLOGIC SERVICE

The clinico-pathologic service up to November 30, 1917, constituted the bulk of the laboratory work, though it was far from large. During this period, there were few patients in hospital and, as the troops were mostly in the Services of Supply or in training areas, clinicians were able both to study their cases carefully and to utilize the laboratory facilities to good advantage.¹⁵ Many of the cases in hospital during this period were suffering from acute infectious diseases of respiratory types, though true pneumonias did not reach a high rate until December. A relatively high venereal rate which occurred in November, 1917, made necessary many routine laboratory examinations. The laboratory records for this period, however, are very meager, since regular monthly reports were not then made.¹⁵

The clinico-pathologic work for the second period, from December 1, 1917, to May 31, 1918, was similar to that of the first. The epidemic of pneumonia, beginning in the fall of 1917, gradually subsided, but a relatively large number of patients with other diseases, particularly meningitis, scarlet fever, diphtheria, and measles, were in hospital, and on these patients a large amount of clinico-

pathologic work of a routine character was necessary.¹⁵ The relatively high venereal rate in December, 1917, dropped materially toward the end of this period.¹⁵

The total amount of clinico-pathologic work done during the first and second periods was low in relation to the number of cases in hospital and to the number of both commissioned and enlisted personnel.¹⁵ This was due to difficulties in providing accommodations for laboratories, to lack of equipment, to untrained enlisted personnel, and in some instances to "overtrained" commissioned personnel. Many of the base hospitals in the American Expeditionary Forces which first arrived in France were manned on the laboratory side, as well as in the other professional departments by highly trained specialists.¹⁵ A number of these had been concerned in their recent civil experience only with teaching or research and a considerable period elapsed before some of them could readjust their ideals so as to properly evaluate simple routine clinico-pathologic examinations, such as those of urine and blood.¹⁵

For the third period—i. e., from June 1, 1918, to November 30, 1918—the records were fairly complete, though during this period the laboratory service being to the extent of only about 40 per cent of its normal strength, was so greatly overworked that preparation of detailed reports was very difficult.¹⁵

During the fourth period following December 1, 1918, a marked decrease in trained laboratory personnel developed though the continuance of influenza, the outbreak of numerous small epidemics of typhoid fever, and the more careful venereal survey of all troops, necessitated a large amount of laboratory work.¹⁵

It is not the purpose to give here numerical summaries of laboratory work, however, certain points of interest relative thereto should be mentioned.

Leucocyte counts showed a gradual monthly increase which was not commensurate with the greatly increased number of patients in hospital, and did not reach even an approximately proper proportion till February, 1919. This was most noticeable in the relatively small number of differential counts made and was probably due to failure of clinical officers to appreciate the importance of this diagnostic procedure or their failure to insist upon the necessity for such counts.¹⁵

Malaria examinations, which reached their highest number in August, 1918, were notable for their rarity though they probably covered the necessary field more completely than any other laboratory procedure.¹⁵

Examinations of feces for parasites and ova and for entameba were altogether too few. There was little time for these during periods of great stress but during the fourth period they might have been more numerous. It is unfortunately true, however, that laboratory personnel properly trained in the technique of these examinations was seriously lacking.¹⁵ There was a sudden increase in the number of examinations for intestinal parasites in August, 1918, which continued until November of that year.¹⁵

Urine examinations were fairly numerous, but their distribution and quality were very irregular. In many hospitals the specimens were intelligently selected, properly collected, and carefully examined. In some, this was not the case. In others very few such examinations were made.¹⁵

In examinations of sputum for tubercle bacilli, as well as in those of urine, relaxation in thoroughness was prone to occur. Specimens which the laboratory officer knew were not intelligently selected or collected were apt to be superficially examined, thus rendering negative reports of little value.¹⁵ In some hospitals as many as four or five hundred specimens were examined with only four or five "positives" reported. It is true that these were intended as controls in cases of recovery from influenza and pneumonia, but it was suspected that in many instances the lack of care in the collection of sputum and the hasty search for bacilli made the negative findings of relatively little value.¹⁵ The number of examinations of sputum for tubercle bacilli gradually increased reaching their highest point in January, 1919.¹⁵

The number of examinations for gastric contents was relatively small in comparison with such as would have been necessary for an equal number of patients in civil hospitals. Most of the military patients being young, robust, and subject only to wounds and acute diseases, there was little necessity for the examination of gastric contents with a view of reaching a diagnosis of gastric ulcer or cancer.¹⁵

In addition to the chemical laboratory tests which were made in most suspected cases of this character, great reliance was placed upon roentgenology.¹⁵

The occurrence of sporadic cases of true epidemic meningitis at widely separated points in the American Expeditionary Forces, kept the whole Medical Department on the alert. While it can not be demonstrated beyond peradventure that had no measures been taken, serious epidemics of meningitis would have developed, yet it is probable that the early accurate diagnosis and the vigorous methods instituted in most instances immediately on the development of a single case, served in large measure to prevent epidemics.¹⁵ In this service the laboratory officer rendered inestimable assistance to the attending medical officer.¹⁵

Smears for gonococci showed a gradual monthly increase though not reaching a considerable proportion until February, 1919.¹⁵

Dark field examinations for *Treponema pallida* were considerably though not sufficiently increased after the armistice began.¹⁵ It was difficult to find enough officers to make the large number of necessary dark field examinations in a competent manner.¹⁵

Except in the few instances noted above, the general quality of the clinicopathologic examinations was good. A large number of clinicians had been trained in civil practice to expect and more or less intelligently to interpret these examinations. This counteracted the tendency on the part of some laboratory officers to relegate this work to untrained personnel.¹⁵

Up to November 30, 1917, very few post-mortems were made in the American Expeditionary Forces. The clinical service before that date was very light, the attending medical officers and surgeons had time to study their cases with great care, and thus the necessity for a post-mortem examination of the few cases that died was not very apparent.¹⁵ Of the post-mortems that were made, the records either were incomplete or in some instances lost, so that but 14 protocols for this period—representing about one-fourth of the deaths—were received in the offices of the director of the division of lab-

oratories. Most of these autopsies were made at Army laboratory No. 1, Naval Base Hospital No. 1, and Camp Hospital No. 33.¹⁵

During the period from December 1, 1917, to May 31, 1918, the number of autopsies increased in May to 57 per cent of the total number of deaths in hospital. This was due in part to the fact that on April 2 Circular No. 17, (q. v. in the Appendix) was issued from the chief surgeon's office.¹⁵

By the end of May, 1918, there were in the American Expeditionary Forces laboratories serving 25 base hospitals, 8 evacuation hospitals, 32 camp hospitals, 4 Red Cross hospitals, and 1 mobile hospital, besides Army laboratory No. 1, the central Medical Department laboratory, and the base laboratory of the intermediate section, or a total of 70 hospitals and 72 laboratories, in addition to those pertaining to divisions.¹⁵

Less than 15 pathologists in the American Expeditionary Forces were then capable of making post mortems and intelligently interpreting the results. This condition was due in part to the long neglect of the autopsy service in many civil institutions in the United States with inevitable reduction in the number of pathologists, and in part to the overshadowing status of bacteriology in military laboratories.¹⁵ The autopsy service had not been established as a routine procedure in the Army but on the contrary, autopsies were made only on the written authority of the commanding officer of a hospital. However, in the American Expeditionary Forces the need of a routine autopsy service amounting in fact to a professional inspection of the diagnostic and therapeutic measures of officers engaged in clinical service, rapidly became apparent during the summer of 1918. Surgeons were called upon with little time for study or reflection to diagnose and treat enormous numbers of gunshot wounds with which they had had little or no previous experience. Even those who were well grounded in the general principles of surgery were forced to make decisions and institute treatment thereon without sufficient opportunity for study.¹⁵ As a result, there were many errors in diagnosis and corresponding errors in treatment.¹⁵ The worst of these could be determined only by the pathologist. Likewise, medical officers attending cases of gas poisoning, influenza, and pneumonia were confronted by conditions with which they were totally unfamiliar, and frequently were forced to make diagnoses and to institute treatment with a very meager knowledge of the facts. Here autopsies proved of tremendous importance for they afforded knowledge of pathologic lesions which the physicians treating the case could use in their subsequent diagnoses and treatment.¹⁵ When, in the fall of 1918, and in the following winter, numerous isolated epidemics of typhoid fever began to appear, the symptoms and physical signs, in many instances, were so obscure that the clinicians failed to make proper diagnoses and the pathologist was the first to recognize the true nature of the disease on the autopsy table.¹⁵

The director of the division of laboratories, in June, 1918, requested that 10 competent pathologists be cabled for from the United States, in addition to those coming over with hospital organizations.¹⁵ These 10 pathologists arrived in due time and assisted materially in improving this service. The activities in forward areas were now covered to better advantage by dividing the territory into sectors and placing at Baccarat, Toul, Souilly, and Paris,

respectively, competent pathologists attached to an evacuation or base hospital, with orders to act as consultants in their specialty for the surrounding areas.¹⁵ In addition to these measures, the importance of autopsies was brought to the attention of laboratory officers and commanding officers of hospital organizations by inspectors from the division of laboratories, by letters, and by indorsements on monthly reports.¹⁵ As a result, the autopsy service rapidly improved, though there were never sufficient competent pathologists in the American Expeditionary Forces to cover the needs at all points. There were not more than 50 or 60 pathologists among the 685 medical officers in the laboratory service when the armistice was signed, but the service had so increased during the summer and early fall of 1918, that autopsies were performed on 95 per cent of all deaths in hospital. In October the total number of autopsies reached 3,896.¹⁵ This was but 85 per cent of the deaths then occurring in hospitals for the autopsy service like every other was overwhelmed by the enormous number of deaths from influenza and by the battle casualties of the Meuse-Argonne operation.

The greatest number of deaths occurred in the base hospitals. After July, 1918, many more autopsies were done in camp hospitals than in evacuation and mobile hospitals for they not only were more numerous but many of them actually functioned as base hospitals.¹⁵ An attempt was made to study battle casualties, particularly gas poisoning, by centrally located laboratory officers who could be concentrated by the use of motor transportation at any point where casualties occurred. This plan, which was then employed in the French service, usually failed because of lack of transportation.¹⁵

Early in July the recording and cross indexing of autopsy protocols was begun in the office of the director of division of laboratories, but inadequate assistance rendered progress in this direction very slow.¹⁵

After the signing of the armistice, the release from duty elsewhere of a few competent pathologists made it possible to place the analysis of the autopsy protocols concerning a few diseases, on a better basis. In order to facilitate this work in the central laboratory and to obtain the benefit of the review by the competent pathologists scattered throughout the American Expeditionary Forces, three office letters concerning, respectively, influenza and pneumonia, gunshot injuries, and war-gas poisoning were sent out to laboratory officers selected because of their ability and experience.¹⁵ These office letters gave forms for the analysis by the laboratory officer of all cases coming to autopsy under his individual observation. On the receipt of these analyses in the office of the director of laboratories they were compiled and coordinated with one another and with scattered protocols from other laboratories. Two other compilations were undertaken, one on typhoid fever and another on tuberculosis. In addition to these, however, the other autopsy protocols contained a wealth of data for further study on a number of subjects; e. g., meningitis, dysenteries, and cardiovascular lesions.¹⁵

One field of post-mortem examinations which might have yielded invaluable results from the purely military standpoint was entered by but one pathologist in the American Expeditionary Forces. This was the examinations of the bodies of soldiers killed in battle.¹⁵ This service did not necessitate the making

of autopsies, but was limited to a study of the site and character of immediately fatal injuries by a medical officer who had a good knowledge of anatomy and some appreciation of the character and effects of missiles.¹⁵

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CHAPTER XII

THE DIVISION OF LABORATORIES AND INFECTIOUS DISEASES (Continued)

SECTION OF INFECTIOUS DISEASES; SECTION OF WOUND BACTERIOLOGY

SECTION OF INFECTIOUS DISEASES

In November, 1917, the director of laboratories planned the organization of a subdivision to be called the "subdivision of infectious diseases." It was proposed that this work be placed under the direction of an assistant director of laboratories, who should act as general advisor to the chief surgeon, A. E. F., in all matters pertaining to communicable disease.¹ The officer assigned to this position on December 1, 1917,² had begun the organization and formulation of plans of procedure when, in the following month, he was assigned to the trench fever commission. Thereafter, until midsummer of 1918, he was unable to take an active part in the subdivision of infectious diseases, but being frequently consulted by letter and by personal interview, offered many helpful suggestions.¹ In February, 1918, another officer was appointed assistant director in charge of the section of infectious diseases, and with the cooperation of the first incumbent, perfected the organization of the section.¹

FUNCTIONS

The functions of this section were outlined as follows: ³

The function of the subdivision of infectious diseases is to provide an instrument for the prompt epidemiological and bacteriological investigation of transmissible diseases among troops of the American Expeditionary Forces. It constitutes, therefore, direct liaison between the division of sanitation and inspection and the laboratories, and is grouped with the latter only because its activities require the occasional mobilization of laboratory facilities and because its personnel should be capable of directing on the spot any laboratory work which the thorough study of any given situation may require. While operating from the laboratories as bases, therefore, this subdivision constitutes actually a part of the machinery of sanitation.

The duties of the subdivision of infectious diseases consist in:

1. Epidemiological and laboratory studies of outbreaks of transmissible diseases in the American Expeditionary Forces, having as primary purposes the discovery of source of outbreak, its mode of dissemination, and its control.

2. The study and organization of new prophylactic measures.

3. The investigation of special problems which may arise in connection with the control of epidemics.

4. The inspection of laboratories in so far as their diagnostic work, carrier examination, and epidemiological work are concerned.

5. The organization of mobile laboratories for epidemiological work in base sections.

6. The preparation of circulars and literature concerning infectious disease for submission to the chief of the division of sanitation and inspection, laboratory, and infectious diseases.

7. Advisory cooperation with the various sanitary and medical authorities in the hospitalization and isolation of infectious diseases.

Organization.—There will be a central office of this subdivision at the central Medical Department laboratories, A. P. O. No. 721, American Expeditionary Forces, which will be in charge of officers delegated to this work by the director of laboratories.

The activities of this office will include:

- (a) The selection of personnel to carry on the work of the subdivision.
- (b) The supervision of the work of this personnel whenever necessary in a given outbreak.
- (c) Periodical inspection of the laboratories of the front area in regard to their work on infectious diseases, and similar inspection of other laboratories of the American Expeditionary Forces when so instructed by the director of laboratories.
- (d) The maintenance at the central medical laboratories of records of the activities of this subdivision.
- (e) The study of special problems that may arise in connection with transmissible disease.
- (f) In the advance section and zone of the advance, the officers assigned to the work will keep in constant touch with the incidence of infectious disease and personally investigate any focus which seems to them or to local authorities to call for investigation. They will personally undertake similar investigations in the base sections when instructed to do so.

There will be assigned to the base laboratory in each base area and to each army laboratory an officer who is ready to carry out similar work in his respective area at the direction of the division of sanitation, inspection, laboratories, and infectious diseases. He will be ready to proceed to any point in the base section when notified by the chief surgeon of the section to do so. His orders will come through the commanding officer of the base laboratory to whom he will be responsible for the proper performance of the laboratory work and the return of the property he may take with him. He will take with him from the base laboratory a mobile laboratory car or any material and personnel he may require for the particular work to be done. If, in the opinion of the authorities concerned, any situation becomes sufficiently grave to require advisory cooperation of the officers in charge of infectious diseases at the central medical laboratories, a telegraphic request will be made on the central medical laboratory and the director of laboratories will send one of the officers in charge of the subdivision of infectious diseases to the point where advice is needed.

In the advance section and zone of the advance similar personnel will be assigned for similar purposes to the Army laboratories. But in addition to this, these areas being directly accessible to the central medical laboratories, the officers assigned as assistant directors for infectious diseases will keep in constant touch with infectious disease occurring in these areas and proceed without further orders to any point where infectious disease is reported, in order to investigate whether further study, segregation, etc., is needed.

Suggested mode of procedure.—When the occurrence of cases seems to call for the detailed study of local conditions, orders will be issued to the officer stationed at the respective base laboratory who will proceed to the station indicated. On arrival, he will report to the local chief surgeon and will familiarize himself with local laboratory facilities and arrange cooperation with local laboratory personnel. He will consult local sanitary officers and obtain a careful history of the outbreak from its beginning, will visit commands and quarters from which cases have been taken, make spot maps of occurrence, trace contacts, and investigate relations of case to case. He will study relations of outbreak to water and food supply and will proceed to organize and carry out any laboratory work or serum tests necessary to elucidate the situation and control the disease.

In consultation with local medical authorities he will inaugurate sanitary measures aimed at control of the disease and on completion of the work will submit a report, incorporating specific recommendations. A duplicate copy of this will be sent to the chief of the division of sanitation and inspection, laboratories, and infectious diseases. One copy will be left with local chief surgeon, and one will be retained as a record of the subdivision of infectious diseases.

In the advance section and zone of the advance, the officers in charge of the subdivision of infectious diseases will supplement this system by visiting as promptly as possible all locations where infectious disease is occurring, and determine by personal investigation whether the situation requires special study.

The duties of this section as finally prescribed were published in Circular No. 40, chief surgeon's office, July 20, 1918. (See Appendix, p. 958.)

It was not proposed that this section would engage in research, except in so far as the study and suppression of outbreaks of disease necessitated. Its primary purpose was the early discovery of foci of infection, the prompt tracing of cases to the point of their infection, and the suppression of diseases traced in this manner before they could reach epidemic proportions.¹

Though the foregoing plans had been formulated for the development of this section of the director's office, no personnel was at first available to carry these into effect.⁴ Such outbreaks of epidemic diseases as did occur were investigated by field parties sent out from Army laboratory No. 1 at Neufchateau.⁴ Only four divisions were in France at the end of December, 1917, and the only epidemic diseases requiring investigation by this section were small outbreaks of meningitis, diphtheria, scarlet fever, influenza, and pneumonia.⁴ Water supply surveys were carried out in very considerable portion of the then existing divisional training areas by field parties from Army laboratory No. 1, and it became evident, from these early surveys, that approximately 85 per cent of the water for drinking purposes was contaminated. This initial estimate of the water-supply situation in France was confirmed by surveys at a later date.⁴

All matters relating to transmissible disease were referred to the section of infectious diseases, for it was concerned mainly in the investigation of epidemics, development of the organization for their control and prevention throughout the American Expeditionary Forces, the preparation of bulletins relating to prevention and control of transmissible diseases, the standardization of methods for combating them, and standardization of the use of therapeutic sera which were of value in this work.⁴ Reserve personnel for the investigation of epidemics was attached to the central Medical Department laboratory at Dijon, and most of the investigations of epidemics conducted under the control of the director of laboratories and infectious diseases were prosecuted in cooperation with and under the direct supervision of the commanding officer, central Medical Department laboratory.⁴ The duties assigned to the division of laboratories and infectious diseases by Circular No. 40, chief surgeon's office, and the memorandum quoted above, indicate how closely the central laboratory and the section of infectious diseases were associated.⁴ In April, 1918, preliminary steps were taken to coordinate the central office of the section of infectious diseases with those engaged in similar service in the several administrative sections of the Services of Supply.⁴

Because of rapidity with which American troops arrived and of the large territory over which they were distributed, decentralization of the epidemiological service became necessary for proper supervision and prompt action.¹ In the original plan it had been contemplated that a standard uniform method of control throughout the American Expeditionary Forces would be adopted and that a selected and trained officer qualified to make epidemiologic and bacteriologic studies of outbreaks of infectious diseases would be stationed in every section of the Services of Supply. Each section epidemiologist was to have available a main laboratory adequately equipped for the performance of any diagnostic or other laboratory work. It was expected that this officer ordinarily would handle problems arising in his section but that in emergencies he would obtain extra personnel and equipment from the director of laboratories

and infectious diseases.¹ Later, after conferences with medical representatives from the various administrative sections of the Services of Supply, and after receipt of their replies to a circular letter sent them concerning the adoption of methods for control of infectious diseases, a somewhat different plan for the organization of epidemiologic service in these sections was formulated.¹ This plan, which was generally adopted, with some variations to meet particular local problems, provided that the several sections of the Services of Supply would solve their respective problems.¹ However, in each section an epidemiological service with laboratory facilities was established, and though each such epidemiological service operated more or less independently of the central administration of the division of laboratories and infectious diseases, it called upon the central laboratory for advice, personnel, and material, whenever needed, and was in constant communication with it.¹

Also it had been planned that in the advance section and zone of the armies the epidemiologic work would be centralized at the office of the director of laboratories and infectious diseases, that through the office of the respective chief surgeon, the director would be kept constantly informed concerning the incidence and location of infectious diseases, and that he would have sufficient personnel and mobile laboratory equipment immediately to give assistance where necessary.⁵ In point of fact the control of infectious diseases among troops in the army zone remained under the direct supervision of the director of laboratories until the later summer months of 1918.¹

Arrangements for the prevention and control of epidemics among the troops in the zone of the armies utilized and expanded resources and methods already provided by Tables of Organization.⁵ The division sanitary inspector, as assistant to the division surgeon was, as theretofore, primarily responsible for the health of the division. He attended to all ordinary matters affecting sanitation in which duty he was assisted by two officers previously not provided in our service, viz, the laboratory and water supply officers.⁵ The divisional laboratory officer was in charge of a small laboratory equipped for clinical pathology but inadequate for extensive cultural work; the divisional sanitary inspector of water, who had had some training in general bacteriology, performed examination of water supplies.⁵ As soon as resources of personnel permitted, these officers, intended for these positions, were given an intensive course of training at the central laboratory at Dijon, before they were assigned to divisions.⁵

Some divisions came to France without laboratory officers, but they were furnished them after arrival from personnel assembled and equipped by the section of infectious diseases.¹

It was intended that the divisional laboratory officer should act not only as a technical laboratory worker for the division but should assist the sanitary inspector in making epidemiologic surveys and sanitary inspections.¹ It may be said, in passing, that in many cases this could not be effected because of the lack of transportation.¹ This divisional organization was quite adequate under ordinary circumstances to deal with conditions that threatened the health of the troops, but because of insufficient laboratory equipment and shortage of personnel, it was necessary in any considerable outbreak of communicable disease to send reinforcements.¹

The duties of the division sanitary inspector of water were reduced to their simplest forms. He supervised the chlorination of drinking water in the division, gave appropriate instructions, kept in touch with any water problems that arose, and constantly reported concerning the purification apparatus available.¹ Laboratories adequately equipped for the examination of all water supplies were not available for issue to the divisions.¹

Because of insufficient personnel and laboratory equipment in a division wherewith to combat epidemics, Bulletin No. 32, G. H. Q., A. E. F., May 27, 1918, was issued, which provided that such resources could promptly be augmented whether troops were in the lines or in training areas. This bulletin authorized an army or division surgeon to communicate in emergencies directly with the director of laboratories and to request assistance; the director of laboratories was authorized to send such personnel and equipment as might be necessary, and to cooperate to the extent of his resources.

The section of infectious diseases was active throughout the advance section and assisted in the control of outbreaks of diphtheria, scarlet fever, measles, meningitis, influenza, and diarrhea, employing in this service additional laboratory personnel and equipment; e. g. mobile laboratory cars, constructed and completely equipped according to the English plan (with some modifications) for the investigation of such epidemics as might arise.¹ Usually they were manned by one commissioned officer, a driver and a technician, dispatched on telegraphic requests either from the central Medical Department laboratory at Dijon or from Army laboratory No. 1, at Neufchateau (where one of these cars was stationed), according to the area from which the request was received.¹ Sometimes the local laboratories of base or evacuation hospitals were utilized, and additional resources were dispatched in response to telegrams to the director of laboratories at Dijon.¹

To further meet the requirements of field investigations of outbreaks of epidemic disease the laboratory service began, about April, 1918, to assign to duty at the central Medical Department laboratory special, well-trained medical officers whose primary duty was the direction of field parties engaged in the investigation of epidemics.⁴ Usually there were from two to four such officers engaged in activities of this character. There were also mobilized at the central laboratory for use by these parties several special laboratory units consisting of equipment packed in chests and two of the motor laboratories mentioned above.⁴

Laboratory methods securing early diagnosis, detection of carriers, and practical measures of control of infectious diseases were standardized and put into general operation.⁵

In July, 1918, American troops actively engaged in the Chateau-Thierry sector suffered very extensively from diarrheas and dysenteries.⁵ During the period from July to November, 1918, the activities of this section were greatly decentralized so that by November its functions were mainly those of adviser to the chief surgeon's office in general policies relating to the prevention and control of transmissible diseases.⁴

Meanwhile decentralization had continued so that the several administrative sections of the Services of Supply were relatively independent of central supervision and in each a special base laboratory had been established.¹

As American troops concentrated in the advance section and in the zone of the Army, and more and more divisions began to participate actively in combat, other daughter organizations were split off from the central office of the section of infectious diseases, to serve the several corps or armies.¹ It was decided, as the result of experiment, that these organizations should belong to armies rather than to corps.¹ Therefore a sanitary inspector was assigned to the Second Army and a system similar to that in the administrative sections of the Services of Supply was put in operation but modified to suit moving troops. In consequence, the sanitary organization of an army also became largely independent, (except for personnel and laboratory supplies) of the central office.¹ When the Third Army was organized, for the occupation of the American sector on the Rhine, a sanitary division was created, as part of the office of the army surgeon.¹ The duties of the section of infectious diseases in so far as the Third Army was concerned, pertained especially to coordination, supervision, inspection, advice, and provision of personnel and equipment.¹

As a result of this sectional organization, with trained men in definite areas or assigned to service of bodies of troops, and the aid of mobile laboratories, it was possible to render prompt assistance, make surveys for carriers, correct sanitary defects, and materially aid in the prevention and suppression of epidemics.⁵ Numerous investigations were made of outbreaks of measles, meningitis, influenza, pneumonia, diarrhea and dysentery, typhoid and paratyphoid fevers, scarlet fever, diphtheria, and similar diseases. The sources were sought out and recommendations for their control made.

Concurrent with the development of its field service the section of infectious diseases prepared circulars pertaining to control of infectious disease, and conducted instructional work.¹ This latter activity which at first was limited to consultations with laboratory officers intended for assignment to divisions, developed into a course of instruction in carrier investigation and other technique needed in field work concerning communicable diseases and the supervision of drinking water.¹

When the armies had been organized with epidemiological facilities this service, for all the larger units of the American Expeditionary Forces, had become decentralized.¹ Thereafter the duties of the section of infectious diseases were more of a supervisory and advisory character than those of actual participation in the solution of problems, as they had been formerly.¹

The section of infectious diseases continued to act as adviser of the chief surgeon, A. E. F., in the formulation of broad policies of sanitation, and in the circularization of information relative thereto, until it was abolished.¹ Its activities were absorbed into the chief surgeon's office after headquarters of the division of laboratories moved to Tours in June of 1919.¹

SECTION OF WOUND BACTERIOLOGY

After a study of bacteriologic investigation of war wounds as conducted by our allies, and a survey of the organization employed for this purpose, at La Panne, Bouleuse, Epernay, and Chalons, a section charged with the supervision and correlation of such work in the American Expeditionary Forces was established in the division of laboratories in March, 1918.⁶ Its purpose was to be the dissemination of information on this subject and the determination of the circumstances under which a delayed primary or secondary suture of a wound might best be performed. Secondary and delayed primary closure were being practiced among our allies only after laboratory findings indicated the advisability of such practice and the provision of personnel and equipment for obtaining similar findings in the American Expeditionary Forces was deemed advisable.⁶

The scientific value of the examination of war wounds was subordinated to practical needs in the organization of this section, for few statistical data apparently were being collected by the laboratories of our allies where research work was being conducted. The prime services rendered by this section were assistance to surgeons who had not had much experience in treatment of war wounds, the provision of a control which would complement professional acumen of the more experienced surgeons, and, in time of stress, would relieve them of making close studies which otherwise would have been necessitated clinically.⁶

It was planned that a trained wound bacteriologist and an assistant would be assigned to each mobile, evacuation, and base hospital, and that this personnel would be increased as resources in general laboratory personnel permitted. This additional personnel was to be organized in teams which were to be transferred as required. The entire service of wound bacteriology was to be under the control of an assistant to the director of laboratories, who was to provide, train, and distribute these specialists, supervise their activities and conduct appropriate research.⁶ It was planned that a statistical bureau would collect data concerning the bacteriology of war wounds from all hospitals in the American Expeditionary Forces and that an agency which would distribute literature on this subject would also be established. Studies at the central laboratory were to supplement those in the several hospitals and the central laboratory was to prepare and distribute media and reagents both in order to lessen the work of the laboratories at the front and in order to standardize materials. Such research as was to be conducted was to be of immediate practical value.⁶

But these plans did not fully materialize: The paucity of officers did not permit the formation of teams as planned; lack of transportation prevented the central laboratory renewing prepared media, ingredients for media being substituted therefore.

Officers who, in their replies to a questionnaire, were found to have the necessary training in general bacteriology were ordered to the central laboratory at Dijon where they were given an intensive course in wound bacteriology. This comprised laboratory instruction, autopsy demonstrations, and a certain amount of training at the bedside. Classes consisted of about 20 officers, whose course of training lasted two weeks. The number instructed at the central Medical Department laboratory totaled 134.⁶

A few officers were trained at other points, viz, 7 at Epernay, 6 at Autichir No. 21, 7 at Evacuation Hospital No. 1, and 4 in hospitals belonging to the Allies. When the armistice was signed, officers trained in wound bacteriology were assigned to all evacuation, mobile and base hospitals except the most recent arrivals and a few of the hospitals serving at hospital centers. The number of wound bacteriologists thus assigned were as follows:⁶ Evacuation hospitals, 16; mobile hospitals, 13; Red Cross military hospitals, 10; base hospitals operating separately, 18; base hospitals in hospital centers, 66.

Though there was inadequate time to work it out, the plan was to provide one officer trained in wound bacteriology for each 500 surgical beds and recall from time to time officers already instructed to receive further instruction in newer methods and to discuss their several problems, administrative and professional.⁶

The most difficult problem experienced by this section was the preparation of records and the collection of statistical and other data. Two blank forms were devised, one relatively very brief for use in periods of stress, the other more thorough, to be used in periods of relative quiet, but only a relatively small number of organizations found it possible to collect fairly complete records.⁶

A monthly statistical report form was also called for but this was utilized by only a small number of organizations. These units, however, went far toward collecting the information desired.⁶

Special investigations concerning gas gangrene, the use of antigas gangrene and antitetanic sera, and the possible infection of wounds by attendants were undertaken. Research seeking the recovery and identification of organisms concerned in wound infection and the value of certain smears and indicators was also undertaken at the central laboratory.⁶

On October 29, 1918, the head of this service reported as follows to the director of laboratories: ⁶

At present the central organization of the section of wound bacteriology is still unmanned. While an adequate number (considering the number of laboratory officers in the American Expeditionary Forces and the needs of other sections of this division) of wound bacteriologists for service in the field is now available, the administrative force in the central office is inadequate properly to control the work of the officers in the field, to analyze and arrange the statistical evidence which is rapidly accumulating, and finally to verify the identification of bacterial species recovered from important cases.

The most important single need of this section is an officer with considerable laboratory experience whose duty it will be to make frequent inspections of all the laboratory units engaged in the bacteriologic study of war wounds with a view of determining the efficiency of the workers in this field, of raising the standards of the work done by correcting obvious defects and stimulating enthusiasms for this particular work, both among the laboratory officers and among those engaged in the surgical care of the wounded, and finally of collecting data which might serve as a basis for the improvement of the service. The rapid increase in the number of hospital organizations in the American Expeditionary Forces and the extent of the area which they occupy makes such additional assistance necessary.

Two additional officers to conduct research concerning the bacteria found in wounds, an officer to analyze reports received, and two file and record clerks for headquarters were also required. These needs were obviated by the declaration of the armistice on November 11 and the section as such submitted its final comprehensive report on December 4, 1918.⁶

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CHAPTER XIII

THE DIVISION OF LABORATORIES AND INFECTIOUS DISEASES (Continued)

SECTION OF WATER SUPPLIES; SECTION OF FOOD AND NUTRITION; MUSEUM AND ART SECTION; LABORATORY OF SURGICAL RESEARCH

SECTION OF WATER SUPPLIES

The entire question of water supply and purification in the American Expeditionary Forces is dealt with in Volume VI of this history. Therein reference is made to the fact that stationary laboratories were established in the Services of Supply, A. E. F., for water analysis in certain Medical Department general laboratories. One of these laboratories was the central Medical Department laboratory at Dijon.¹

In addition to water analysis, a subject which is outside the scope of the present chapter, the necessity existed for supervising water supply activities in the zone of the advance, not otherwise cared for by the water supply service, A. E. F. This supervision centered in the central Medical Department laboratory at Dijon. Until the latter part of September, 1918 (except for a short period that is referred to below), the water supply activities of the division of laboratories were supervised by the section of infectious diseases.² It was during May, 1918, that efforts were made to organize a definite section in the central laboratory for coordinating water supply. Such a section was established and charged with the coordination of Medical Department activities pertaining to water supplies in the zone of the advance. However, since the officer then assigned to the section was retained therein only a short time, it was not until the following early fall that water supply work of the Medical Department in the zone of the advance was definitely coordinated.²

On September 27, 1918, an officer of the Sanitary Corps, expert as regards water supply and analysis, was assigned to organize a section of the central laboratory having to do with control of such water supplies in the zone of the advance as come within the province of the Medical Department.² Thereafter, that section was engaged in the supervision of water surveys in all training areas in the Advance Section, the assignment of proper Medical Department personnel, the instruction of divisional personnel in water survey work, including control of chlorination of water supplies, and coordination with the officer in charge of the laboratories in the water supply service.² The chief of the water supply section in the division of laboratories and infectious diseases was the representative of the Medical Department, in its liaison with the water supply service, A. E. F. made; plans pertaining to Medical Department activities connected therewith, and distributed the laboratory facilities which were made available for water analyses.²

SECTION OF FOOD AND NUTRITION

In August, 1917, there was organized in the Office of the Surgeon General a division of food and nutrition, whose officers were authorized by the Secretary of War on October 16, 1917, to inspect food supplies in camps, to endeavor to improve the mess conditions, and to study the suitability of the ration and the food requirements of the troops. Officers of this division were sent to camps in the United States where they gave instruction to cooks, mess officers, and unit commanders and also made extensive studies of ration suitability and requirement.³

On January 18, 1918, the chief surgeon, A. E. F., requested that suitable officers be sent to France for similar services in the American Expeditionary Forces,⁴ and one month later the commander in chief, A. E. F., made the same request by cable.⁵ Accordingly, six officers were selected for this purpose and on March 1, the Surgeon General wrote the chief surgeon, A. E. F., that they would report for service after having studied food conditions in England.⁶

The Surgeon General outlined the nature of the services these officers already had rendered and suggested that they be authorized to make a thorough inspection and study of all food supplies and mess conditions and report to General Pershing, through the chief surgeon, A. E. F., on the following subjects:⁷ The quality of all Army subsistence supplies; the adequacy of the field ration (permissible and desirable modifications of the ration from the standpoint of transportation difficulties); balancing of menus (the desirability from the standpoint of economy of simultaneous menus for entire divisions); improvement in mess conditions with a view to the greatest conservation of food consistent with adequate feeding; suitability of hospital dietaries; suitability of rations used in prison camps with a view to greater economy; correlation of practical experience of other armies with regard to rations and mess conditions and its application to our own forces.

This letter was accompanied by documents which described the work already performed by the food and nutrition service in Army camps in the United States.⁷

Among the members of this initial group and the personnel who reinforced it later were men who in civil life had been State food commissioners, experts in the Bureau of Chemistry, physiologists, biochemists, organic and analytical chemists, State and city food inspectors, and those who had had practical experience in the large packing houses in the United States.⁸ Members of the section throughout were selected because of their knowledge of its specialties, with the result that collectively they were qualified to solve the scientific and practical questions pertaining to its activities.⁸ The officers composing the first group sent overseas had received training from three to six months in the camps in the United States, and the others who came later received training during variable periods.⁸ Having been trained in the United States, where saving privileges on the garrison ration were permitted, members of this section were not as familiar as could have been desired with preparation of the garrison ration if it were not supplemented by purchases nor with the possibilities of the rolling kitchen—i. e., with basic conditions pertaining to the preparation of food in the American Expeditionary Forces.⁸

The officers composing the initial group remained in England from March 16, to April 2, 1918, studying the British system of rationing and its administration and making a preliminary survey of the service of food in American rest camps.⁷ One officer who was detached to remain in England and to attempt correction of the nutritional defects there discovered in the American service remained on this duty until the end of November, 1918.⁷ The other members of the group proceeded to France, where they reported to the chief surgeon, A. E. F., April 12. The chief of this service was assigned to duty under the director of the division of laboratories and infectious diseases, with office at Dijon, and the other members to different sections of the Services of Supply, in order that they might conduct inspections therein concerning food and nutrition, make practical recommendation, and improve the subsistence of troops.⁷ When these assignments were made the chief surgeons of the sections concerned were notified of the nature of the work the officers would perform, and their cooperation was requested.⁹ After these inspections were completed the members of the group held a conference at Dijon, where they discussed the defects they had noted in food supply, its preparation and service.⁷

In order to promote the correction of these faults and to study nutritional requirements that would eventuate if it became necessary to reduce the quantity of the ration, the chief surgeon, A. E. F., directed that a food and nutrition section be established under the control of the director of the division of laboratories and infectious diseases.⁷ To this section the following duties were assigned:⁷ Representation of the chief surgeon, A. E. F., in matters pertaining to the nutrition of troops; investigation of Army food requirements and consumption; advisory service in the specification of rations and dietaries; inspection of food supplies and mess conditions with troops, hospitals, and prison camps; instruction in food inspection and handling, mess management, and other measures for the maintenance of nutrition and for the conservation of food.⁷ The organization of this section was announced in Circular No. 37, chief surgeon's office, in June, 1918, and in the following month its duties as noted above were published in Circular No. 40, chief surgeon's office, July 20, 1918. It acted on all matters of importance pertaining to the food supply of the American Expeditionary Forces, maintaining close liaison with the chief quartermaster, A. E. F., and with the fifth section of the general staff, A. E. F., which was charged with instruction and training.⁷

Based upon a survey which four officers of this service made in May and June, 1918, of the food conditions in six divisions in the advance section, finding it advisable that personnel qualified to give instruction be attached to these organizations for more or less permanent duty, moving with them in successive changes of station,¹⁰ the representative of the Medical Department with the fifth section of the general staff, on July 8, 1918, submitted the following memorandum to the acting chief of staff G-5:

Subject: Project for Instruction in Cooking and Food Conservation.

1. *Cooking schools*.—Instruction in food values, selection and balancing of the ration, mess management, cooking, use of the rolling kitchen and improvised cooking devices, arrangement, cleaning, and care of kitchen equipment, storage, preservation, and conservation of foods,

and kitchen sanitation is given to selected replacements in the school for Army cooks in connection with the school for bakers at the base division, first corps. Similar schools are projected in other base divisions.

2. *Field parties.*—Officers of the food and nutrition section of the Medical Department have been visiting the various divisions and base sections in France for purposes of observation and instruction, and three are now on duty with the United States troops in England. Action has been taken to secure additional trained officers of the food and nutrition section from the United States in order to give sufficient personnel for extension of the work. Field parties (consisting of one officer of the food and nutrition section, one butcher, and two cooks) will be assigned to a certain area corresponding to that covered by the division of any army corps and will be kept moving from division to division within that area. They will observe the methods of distribution and handling of the ration, mess management, cooking, kitchen economy, serving and food conservation, and will establish temporary centers of instruction for mess sergeants and the methods and procedures adapted to the conditions found.

3. *Source, control, and distribution.*—Officers engaged in this work will come from the officers of the Sanitary Corps, food and nutrition section of the Medical Department. The butchers will be secured from the enlisted men of the Medical Department, Quartermaster Corps, and from replacements trained in the cooking schools. Control of field parties and personnel attached to base sections and various headquarters will lie in the sanitary section of the office of the chief surgeon in cooperation with G-5. Control of the instructors of the various schools will lie with the commandants of these schools, or the commanding officers of the base divisions in cooperation with G-5. Distribution will be tentatively as follows:

At Medical Department laboratory:

	Officers
Officer in charge food and nutrition section (general supervision)	1
Officer on duty in the food laboratory	2
Officers for emergency examination and instruction	2
On duty at base section in England	3
On duty at base sections in France	5
On duty at First Corps schools	2
On duty with hospitalization section, chief surgeon's office	1
On duty with chief quartermaster	1
On duty at cooking schools	2
	19

	Butchers	Cooks	Officers
Field parties:			
For 5 army corps	5	10	5
Services of Supply troops	2	4	2
	7	14	* 26

* Including 19 from above.

Increases in personnel and parties will have to be made as necessity arises.

With the approval of the assistant chief of staff G-5 and the cooperation of the chief quartermaster, the section now organized field parties, each of which consisted of one officer from the food and nutrition section, one butcher, and two cooks, with the grade of noncommissioned officer, the last mentioned being drawn from the Medical Department, Quartermaster Department, and replacements.⁷ During the period of its greatest activity about 40 noncommissioned officers, cooks, and butchers were assigned to the nutrition service, most of them being incorporated into the field parties. These units were sent to divisions at the front training areas, military schools, and later to organizations in sections of the Services of Supply.⁷ Before a party reported to the organization

to which it was temporarily assigned, the adjutant general, A. E. F., sent to the commanding officer concerned the following form letter:¹¹

1. In compliance with instructions from these headquarters a field party of the food and nutrition section, Medical Department, has been assigned for temporary duty with the organizations of your command.

2. This field party is charged with the investigation of ration conditions as to transportation, handling, preparation, and conservation, and instruction of mess sergeants and cooks as to field mess management, field cooking, and conservation within these organizations.

3. It is desired that the officer in charge of the field party be given proper authority and support in order that he may carry out the duty to which assigned. The officers in charge of the field party have been directed to make reports to the director of the Medical Department central laboratory, A. E. F., and authorized to make reports to the division surgeon of the organization with which he is on duty, or as you may direct. Attached find a copy of "Duties of field food and nutrition officers," which will fully explain the duty required of this party.

DUTIES OF FIELD FOOD AND NUTRITION OFFICERS

PROCEDURE ON REPORTING TO THE ORGANIZATION

1. Report through adjutant to the commanding officer. Present to him your orders, with a statement of your duties, and request that local orders or authority be issued. Suggest that the local order authorize you to inspect all food materials from their receipt by the organization to their consumption by the men; to inspect condition of all kitchens and the efficiency of their administration; to give instruction to mess sergeants and cooks in mess administration and in the storage and preparation of food, and to make recommendations to organization commanders, mess officers, and to the commanding officer in matters affecting the proper feeding of the men and the conservation of food.

2. Report to the division surgeon or senior medical officer, explain your mission, present to him your instructions, request his advice, and follow his suggestions.

3. Consult with the railhead officer, division quartermaster, or subsistence officer and supply officers and examine food supplies to obtain information re the ration issued, the various components, their percentages, quality, period of issue, storage facilities, and method of distribution.

4. Visit all kitchens in the organization; note and record in each the points covered in the outline of the reports. Give individual instruction personally, and through noncommissioned officers of the field party, to mess sergeants and cooks for the improvement of the mess and avoidance of waste. See that they know what the ration is and whether they get all of it. Consult organization commanding officers and make recommendations to them where desirable.

5. Choose one or more centrally located kitchens illustrating conditions in the area and develop them as models for the practical instruction in cooking, mess administration, and avoidance of food waste. Build here model bread boxes, shelves, meat safes, work tables, grease traps, and any other devices which can be made of the materials at hand or obtainable. Assemble here, with the permission of the proper authorities, the officers, mess sergeants, cooks, and men of different units and demonstrate the advantages of your devices, the importance of good meals, and the necessity of avoiding waste. Accept and stimulate suggestion and criticism. Devise a system of competition between messes, involving the recognition and public mention of excellence.

6. If accompanied by the noncommissioned officers, cooks, mess sergeants, or butchers, distribute them at various points in the area so as to give the necessary practical distribution over the whole organization as quickly as possible.

7. Your first duty is to improve the food as served to the men. Food conservation is merely giving the men more and better food and putting less in the garbage pail and extracting or saving for mess consumption or commercial use all material of value. In training areas and in positions not exposed to shell fire there should be no food waste; material not used should be deducted from the following issue, with corresponding reduction in transportation, tonnage, and drain upon resources at home.

With troops occupying trenches or positions under shell fire there will be frequent and inevitable waste of food as well as of other material. Your duty under such conditions is to urge that such food be allowed and delivered as will make possible the proper feeding of the men in spite of unavoidable waste. Study the food needs of the men and take steps to insure that the needs are complied with.

Report on any unusual requirements of particular troops.

8. Make reports weekly to the food and nutrition section, A. P. O. 721.

9. Notify the food and nutrition section one week in advance of the time that your work within a division is to be completed, requesting orders to move to another organization.

REPORTS

1. Officers will make oral or written reports to commanding officers through division surgeons or other officers under whose direction they work. These reports should contain a brief statement of conditions found and specific recommendations for their improvement. Avoid long reports. Don't criticise unless you are able to have the fault corrected. Be sure that your recommendations are practicable—otherwise don't make them. Correct faults by informal conference and suggestion or by your own efforts before writing reports about them. Always pay due respect to military courtesy and the limitations of your authority, which is only advisory.

2. In addition to reports within the organization, officers will make regular reports weekly by mail to the director of laboratories, food and nutrition section, A. P. O. 721, and special reports by telegraph whenever necessary. Officers in the various sections of the Services of Supply will similarly report to the chief surgeon in that section.

3. The outline below will serve as a guide in inspections and in the preparation of weekly reports. Adhere to the numbers as stated and it will permit considerable abbreviation. In reports after the first, from each division it will usually not be necessary to repeat items under A. B., etc., covered in the first report.

To: Director of laboratories, food and nutrition section.

Heading: Organization; date covered by report.

Party No.: Number of report.

Contents:

A. Information obtained at the railhead or chief supply point.

1. Storage facilities.
 2. Amount of reserve food on hand, (1) garrison ration, (2) field ration, (3) reserve ration (4) trench reserve ration, (5) travel ration.
 3. Wastage at railhead or in reserve storage.
 4. Ration being issued with proportion of each component and substitute.
 5. Period of issue; system of issue.
 6. Quality of food material.
 7. Desirable ration changes.
 8. Arrangements for food salvage.
 9. Faults requiring correction.
 10. General comments.
- B. Transportation of food.
- C. Conditions at regimental food dumps or similar food supply points (Nos. 1 to 10, as under A).

D. Report on mess inspections.

(1) Name of organizations; (2) commanding officer; (3) mess officer; (4) mess sergeant with his knowledge of ration efficiency; (5) number of men fed; (6) number of cooks and efficiency; (7) general appearance of kitchen (good, fair, poor, excellent); (8) stove facilities roller kitchens, fuel; (9) cooking utensils; (10) storage facilities; (11) sanitation—kitchen surroundings, personnel; (12) waste, garbage, amount, character, disposal, reasons; (13) menus—character; (14) water supply; (15) arrangements for washing mess kits and dishes; (16) character of service—mess hall, tables, line system, billets, dugouts, trenches, marmites; (17) is food good and are men satisfied; (18) shortage or overdraft shown on ration slips; (19) conditions requiring correction and your action; (20) where possible

calculate or estimate the gross and net food consumption. Record any significant facts not covered above, such as weather conditions, activity of the men, etc., which affect the food consumption; remarks; (21) estimate the amount of food purchased by individual men from data obtained from the canteens, from inquiry from the men or from stores in the vicinity; (22) estimate the amount of food purchased by the organization to supplement the ration; its source; (23) estimate of wine consumption.

E. Give in detail such methods of instruction and demonstration as you have used, with comment on their success.

A field party under the immediate direction of the division surgeon and the sanitary inspector of the organization to which it was assigned (or corresponding officers in other commands) inspected the food supply from its receipt at railhead to its consumption; investigated mess management and mess sanitation; studied the methods of issuing and distributing rations, food preparation, and service, and, by informal conference with those concerned and by practical demonstration, corrected as far as possible any faults in supply, preparation, or conservation of food.⁷ The parties were given a degree of independence which enabled them to develop their own resourcefulness and to adapt their activities to the conditions which the immediate occasion demanded.⁷ These parties worked in close conjunction with divisional agencies, especially the first section of its general staff, the sanitary inspector, the inspector general, the quartermaster, and the several organization commanders.¹⁰ They made detailed inspections of kitchens and instructed personnel, either individually or in groups, gave demonstrations and lectures, and distributed circulars. From January to June, 1919, they gave most of their time to schools which they conducted for mess sergeants and cooks.¹⁰ The program which these parties sought to follow was one which they believed would insure, under mutable conditions, that food was regularly provided and handled to the best advantage in so far as storage, preparation of menus, cooking, serving, sanitation, and economy were concerned.¹⁰

The field parties did not follow inspections by elaborate reports, for they were primarily engaged in constructive criticism and instruction at each mess inspected, but such reports as were necessary and required were made to organization commanders and to supply officers.⁷ Weekly reports were sent by these parties to the food and nutrition section in Dijon in order that it might be kept apprised concerning the suitability of the ration under changing conditions, the quality of supplies, defects detected, progress being made, and other matters.⁷ These reports formed the basis for recommendations pertaining to the ration which this section submitted. It wrote, for example, an order which was adopted with but few changes by the chief quartermaster, A. E. F., and which was published as General Orders, No. 176, General Headquarters, A. E. F., 1918.³

Until September, 1918, when 20 additional officers pertaining to this service arrived from the United States, and two others were assigned thereto from other duties, only the five officers of this section originally serving in France were available there for the service of this section.⁷ One officer of the group first sent, had remained as stated above, in base section 3 (England); two, at Dijon, were engaged in development of the organization of the section, solution of problems referred to its headquarters and in special investigations, while the other three served with field parties which visited different divisions.⁷ As but

few organizations could be given attention for any considerable period a readjustment and concentration of effort became necessary in the armies, and a plan was adopted which contemplated that the field parties be sent to headquarters of different corps in order that they might serve their constituent divisions, but until troops returned to billeting areas after the signing of armistice, the shifting of troops was so frequent that this method proved unsatisfactory. Thereafter it was the reverse.⁷

After the group of 20 officers above mentioned had joined the section, September 1, 1918, others gradually were added, until 43 were on duty with it when the armistice was signed.⁷ Of this total, four officers belonged to the Medical Corps and all others to the Sanitary Corps.⁷ Seventy-three enlisted men, most of whom were serving in the field parties, also were serving in this section at that time. By December, 1918, parties had been attached to 18 divisions for periods varying from a few weeks to several months; and with five of these, two or more parties had been on duty at different times. After January 1, 1919, field parties assigned to army corps served six other divisions and eventually they had served 8 corps and 26 divisions.⁷

After October 18, 1918, when the director of laboratories and infectious diseases was authorized to issue travel orders for the movement of these groups their mobility and value in meeting emergencies was greatly increased.⁷ Such orders were issued for specific purposes only; e. g., investigation of epidemics of food poisoning, inspection and prompt recommendation concerning the preservation of food, and similar purposes.⁷

After the strength of the food and nutrition service was increased in September, 1918, additional field parties were organized, and soon thereafter it became possible to provide officers for base sections Nos. 1, 2, 5, and 7 (in addition to base section No. 3, provided for at the outset) and for the intermediate section.⁷ Officers or parties also were stationed at 10 large camps for considerable periods, and repeated inspections were made of supply, preparation, service and conservation of food as well as other matters pertaining to the mess service at practically all camps in base sections. Many other inspections which sought to be of constructive value were made of other organizations including hospitals in the base and intermediate sections. In base section No. 3 where four officers were on duty for more than five months, practically all organizations were inspected, many of them repeatedly.⁷

The most important problems which confronted the section of food and nutrition during the winter of 1918-19 were the following:⁷ (a) Inspection and report upon needs of labor organizations requesting increases in the ration in accordance with General Orders No. 176; (b) continuation of the inspection and instruction work in base sections with added emphasis on the messing conditions in the embarkation camps; (c) continuance of instruction to divisional troops in the first, second, and third Armies and the development of instruction concerning cooking in their component units; (d) the appointment of special inspectors to safeguard the nutritional interests of our troops on returning commercial liners; and (e) assistance in solving the food problems of the section of civil government in the occupied territory in Germany.⁷ The food and nutrition section also provided a representative for investigation and advice

concerning matters pertaining to his specialty in the Third Army and another who supervised messing conditions in the district of Paris, and investigated questions of factory sanitation that were of interest to the Quartermaster Corps.⁷

From November to May the following new features developed in the work of the section.³ The supervision and assistance in the organization of the large embarkation messes at the base port. This covered base sections Nos. 1, 2, 5, 6, and the embarkation center at Le Mans. At these same base ports a member of this section in each base served officially on the boards which inspected transports to determine the proper food equipment of the same. At advanced general headquarters one of our officers served as food and nutrition consultant on the staff of the officer in charge of civil affairs and there rendered valuable service in determining the food supply of the occupied territory.

From January to June, 1919, the officers assigned to army corps (where they were attached either to the corps surgeon's office, to G-1 or G-3 of the corps) exercised general supervision over the nutritional service of divisions and devoted much of their time to the development of schools for mess sergeants and cooks.⁷

Of the numerous investigations ^a which this section conducted the following were practically noteworthy, viz, food conditions in the zone of the armies, on the Murman coast, and in the sections of the Services of Supply; food service in hospitals; caloric value of the ration; laboratory examinations and analyses of food; inspection of factory conditions pertaining to food supplies; special problems regarding bread and meat issues; rations for later troops and food supply and its service on transports, especially on commercial liners hired for transport purposes by the United States.⁷

The services of the food and nutrition section for the American Expeditionary Forces as a whole was terminated May 26, 1919, but was continued so long as circumstances required in the administrative sections of the Services of Supply and in the remaining army corps, the work being so arranged that officers employed therein could automatically be released when their services were no longer necessary.⁷

MUSEUM AND ART SECTION

For the purpose of collecting suitable medical museum specimens, the Surgeon General, in January, 1918, requested authorization from the commanding general, A. E. F., to send to France a medical museum unit with a designated director.¹² After receipt of the authorization, and a period of two months spent in planning for the collection of museum material in the camps and cantonments of the United States, the director of this unit was ordered to England in order that he might study both the collections made and methods of collecting employed by the British Army, and was then sent to France for further duty.¹² In the meantime Circular No. 17 had been issued by the chief surgeon, A. E. F., calling attention to the importance of collecting museum specimens and giving brief directions for their preservation.¹²

^a For details concerning these investigations, consult Chap. VI, Sec. II, Volume VI, of this history.

The collection of museum and art material in France was made a responsibility of the division of laboratories, for it early became apparent that the procurement of pathologic material would be wholly dependent on the efficiency and activity of the officers who performed autopsies.¹² The first task, therefore, was the improvement of the necropsy service in the American Expeditionary Forces, which at that time, because of lack of personnel for such service, was very inadequate. During the summer of 1918 it became evident that there existed a great need for a routine service of this character which would afford a means of professional inspection of the measures which medical officers employed in their care of patients.¹² This inspectorial need was filled in satisfactorily, and, although the number of pathologists was constantly so limited that they could not give more than incidental attention to the collection and preservation of pathologic material, their collections were more extensive than could have been hoped for under the circumstances.¹²

Since General Orders, No. 15, H., A. E. F., January 24, 1918, limited the practice of photography in the American Expeditionary Forces, in so far as obtaining a pictorial history of the war was concerned, to the Signal Corps, the chief surgeon, A. E. F., in March, 1918, approved an elaborate schedule for the taking of photographs by that corps for the purpose of illustrating the medical history of the war.¹² In order that other technical photographs might be procured, a request was made early in May for the privilege of cabling for photographers and artists who were then in readiness to proceed from the Army Medical Museum in Washington, but this was disapproved by the general staff, A. E. F., in view of the existing tonnage situation, and in the belief that the requirements of the Medical Corps could be met successfully in this particular by the personnel and facilities already available, in both the Signal and Engineer Corps.¹²

On May 3, 1918, the director of laboratories notified the chief surgeon that provision was contemplated for photographic work on anatomical material in the advance section and in the central Medical Department and base laboratories.¹³ It was believed that a sufficient number of men for this purpose could be found in the American Expeditionary Forces, and it was planned to train them, at the central laboratory, in the simple laboratory procedures so that they could serve both as laboratory assistants and as photographers.¹³ Another acquisition desired by the museum and art service of the division of laboratories was a number of artists who could make sketches of anatomical specimens and of medical and surgical procedures.¹³

In July, the division of laboratories reported to the chief surgeon, A. E. F., the lack of men in the Signal and Engineer Corps who had special training in preparing medical illustrations and urged the necessity for special training along such lines in order that good results might be procured.¹² As a result, a cabled request was made to the War Department that a museum unit, consisting of a cinematographer, a photographer, and four artists, with complete equipment and supplies for six months, be sent to France. One officer and seven enlisted men, equipped for making moving pictures, arrived in France September 14, 1918, pursuant to this cablegram.¹²

General Orders, No. 78, G. H. Q., A. E. F., May 25, 1918, amended previous orders on the use of cameras in the American Expeditionary Forces, and

charged the Medical Department with making technical photographs of surgical and pathological interest. To carry out this responsibility, the officer in charge of the museum and art section made a survey of the Medical Department personnel and pertinent equipment in the American Expeditionary Forces. Several men were found who had been trained in photographing medical subjects, but because of the order previously issued concerning the taking of photographs, almost no hospitals were found equipped with photographic apparatus.¹² Those that were so equipped were authorized to place their equipment in use.¹² A few cameras were procured from French sources, 3 were borrowed from the Signal Corps, and 24 from the Roentgenologic department of the professional services.¹² A limited amount of photographic supplies was obtained from French sources.¹²

An examination of the feasible sources of supply—American, French, and British—revealed the fact that nothing but formalin was obtainable for the fixation of pathologic specimens, except in a few base hospitals which had first arrived in France and which had brought with them a small supply of alcohol.¹² The only materials available for color preservation were sodium or potassium acetate and nitrate, one or the other of which was obtained after long delay from the French. These materials, photographic and pathologic, were placed in the central medical supply depot, but the facilities there for distribution either of these or of the other Medical Department supplies used in the museum and art service were inadequate.¹²

After a careful survey of the situation, Circular No. 42 was issued by the chief surgeon's office.¹² This circular, which gave technical instruction concerning the collection and preservation of specimens, is reproduced in the appendix to this volume.

As a result of these efforts, the increase in the total number of pathologists, their assignment at advantageous points, and personal appeals while inspecting laboratories, much interest in the collection of museum material was developed.¹² But the battle activities in June and July so overwhelmed the laboratory division that very few pathologic specimens were collected at that time.¹²

On September 15, 1918, the director of laboratories wrote, through the chief surgeon, to the chief quartermaster under whom the officer in charge of salvage was operating, stating that it was important that certain articles of interest to it, which were employed in allied armies or in that of the enemy, be collected and transferred to the Medical Department.¹⁴ These articles included drugs, sera, chemicals, apparatus, instruments, etc., and ordnance. He stated that the Army Medical Museum was charged with the collection of such material and the provision of arrangements whereby it would be made available for future studies and requested that such articles of the character mentioned as had been selected by a medical officer be transferred to the division of laboratories for shipment to the Army Medical Museum in Washington.¹⁴

In October and November the epidemic of influenza, coinciding as it did with the Meuse-Argonne operation, the period of greatest battle activity in the American Expeditionary Forces, again overwhelmed the pathologists, though by this time their number had materially increased.¹² By this time,

also, an excellent necropsy service had been developed, but only relatively slight attention could be given to the collection of specimens.¹² Nevertheless, despite the limited personnel and the lack of equipment, of supplies, of containers, of transportation, of time, and in fact of everything except a multitude of specimens, upward of 6,000 pathologic specimens were collected, preserved, and shipped to the Army Medical Museum.¹² Most of these related chiefly to war wounds and to gas poisoning.¹²

Early lesions of war gas poisoning were especially difficult to obtain, owing to lack of transportation facilities and of pathologists, and to the necessity for the collection of specimens for immediate study at the pathologic laboratory in the Chemical Warfare Service, with which the Medical Department attempted to cooperate in every possible manner.¹² However, a small but a fairly representative collection of these lesions was assembled. By December 26, 1918, most of the pathologic specimens from gas-poisoning cases had been forwarded to the laboratory of the Chemical Warfare Service for study, and the others, which had been held at the central laboratory, had been shipped to the Army Medical Museum.¹⁵ A number of good specimens illustrating the more striking types of lung lesions occurring during the epidemic of influenza in the fall of 1918 were preserved.¹² Lesions illustrating the often unique course of typhoid and paratyphoid fever in men who had received specific prophylaxis also were collected in considerable numbers during the fall and winter of 1918-19. Fairly good collections were made of specimens illustrating lesions of the brain, and of peripheral nerves and certain other conditions.¹²

About 2,000 microscopic slides of tissue were collected and shipped to the United States.¹²

A small collection of missiles which had caused injuries and which had been removed at surgical operations was preserved, but most of these were returned to wounded soldiers, pursuant to Circular No. 42, Chief Surgeon's office. A fairly complete collection of unused small-arms missiles and fixed ammunition of the several belligerent nations, a few specimens of heavy ordnance missiles and of their fragments, and a representative collection of rifles, pistols, bayonets, trench knives, and other weapons were forwarded to the Army Medical Museum.¹²

On January 13, 1919, the commander in chief instructed army commanders and the chiefs of all technical and supply divisions concerning the collection of material for historical and exhibition purposes.¹⁶

A large collection of helmets, which showed evidence that they had either warded off missiles or been penetrated by them, a small number of pieces of body armor, and other metal objects such as canteens, mess kits, trench mirrors etc., which also showed they had been struck by missiles, were collected and shipped to the museum.² A number of surgical instruments and other items in Medical Department armamentarium, which had been developed or materially modified in our service, or in those of our allies, or in that of the enemy during the progress of the war were collected and shipped.¹²

In September, 1918, several artists (medical illustrators, wax modelers, and others) had arrived in France attached to Base Hospital No. 115, which was stationed at Vichy.¹² An art and photographic section was therefore established in Vichy in the center laboratory of the hospital center, using this personnel

and its equipment.¹² Other artists were assigned from time to time to this art section and were ordered out therefrom to various hospitals in the American Expeditionary Forces where opportunities afforded making illustrations of medical or surgical subjects. This group produced 35 casts of surgical cases, about 200 drawings and paintings, and more than 1,000 photographs of technical subjects.¹² In addition to these illustrations and photographs, which were centered at Vichy, a number of other drawings, paintings, and photographs of technical subjects were made in other hospital centers, particularly at Allerey, Beaune, Chateauroux, and Paris.¹²

The cinematographer, photographers, and artists cabled for in August, 1918, reported for duty to the director of laboratories in the following month.¹² This personnel was distributed as advantageously as possible, principally to cover the activities of combat divisions. Here they remained on duty until the signing of the armistice.¹² Late in September, 1918, the museum section of the division of laboratories had been charged with the duty of cooperating with the Signal Corps in making photographs for the medical and surgical history of the war.¹² The Signal Corps, though it had been authorized in March, 1918, to prepare such photographs, had been able to cover but little of the medical activities of the American Expeditionary Forces except the more popular subjects which were needed for propaganda purposes.¹² After the signing of the armistice and as soon as the general photographers of the Medical Department could be released from their duties with combat divisions, a photographic bureau of the Medical Department was established in Paris for making and collecting photographs and moving pictures illustrative of the medical activities in the war.¹² Personnel of both the Medical Department and of the Signal Corps were assigned to this duty.¹²

The negatives of the medical pictures taken by the Signal Corps photographers were developed by them and two prints of each made for the Medical Department bureau, the negatives being retained by the Signal Corps.¹² The negatives made by medical personnel were developed, printed, and filed in the Medical Department bureau. This bureau filed more than 10,000 still pictures, titled and cross indexed, supplied about 5,000 proof copies to hospital organizations for use in their several histories, and furnished 1,500 prints for medical officers of the general staff of general headquarters.¹² The bureau also photographed about 350 dental specimens. It made about 40,000 feet of moving-picture film of surgical and medical subjects, such as activities in and around hospitals, rehabilitation of convalescent patients, care of psychiatric cases, etc., and filed about 20,000 feet of other motion pictures made by Signal Corps photographers. Nineteen copies of the motion picture, "Fit to fight," were made for circulation in the American Expeditionary Forces.¹² Two other propaganda pictures—"Fit for America" and "How to avoid typhoid fever"—and six copies of a two-reel anatomic picture concerning venereal diseases were also made.¹²

The Roentgenologic division of the professional services, on request from the division of laboratories, packed and shipped about 2,000 selected X-ray plates from their point of origin directly to the Army Medical Museum.¹² These were selected for their technical quality as well as for their scientific interest and

covered in a number of instances special series of cases or series which showed different stages in the treatment and healing of the same case.¹²

Immediately on the signing of the armistice it became obvious that transportation facilities for specimens, not only within the American Expeditionary Forces but also from base ports to the United States, would be exceedingly limited.¹² A supplemental museum circular (No. 58) was therefore issued from the chief surgeon's office December 2, giving directions for expediting transportation and calling attention to the desirability of obtaining material showing stages of healing, etc.¹² As a result of this circular the transportation of pathologic specimens directly to base ports from their points of origin instead of through collection centers was materially expedited, as this procedure required that dependence be placed on a large number of shippers for report of details concerning the individual specimens they forwarded, there eventuated in some instances a lack of the detailed information desired.¹² The shipment of museum material to the United States was greatly hampered by the inevitable confusion incident to general shipping conditions in France and to the lack of tonnage at the close of the war. All the specimens, however, were carefully packed, and it was believed they would not materially deteriorate even if delayed one or two years in transit.¹²

LABORATORY OF SURGICAL RESEARCH

In order that use might be made of the unusual opportunities which the World War afforded for the study of certain conditions, such as shock and hemorrhage, which occur both in military and civil practice, and in order to obtain information wherewith to meet new experiences in war surgery, as these arose, a laboratory for surgical research was established at Dijon.¹⁷ This organization was established on the initiative of the chief surgical consultant and connected with the central Medical Department laboratory. Plans for carrying on the research work were perfected in January, 1918, but it was not until May 1 of that year that active work was begun.¹⁷ Two divisions of the unit were established, physiological and surgical, the former being staffed by 4 officers and 3 enlisted men and the latter by 6 officers, 2 nurses, and 2 enlisted men. Investigations of problems connected with shock and hemorrhage and the development of a satisfactory technique in the treatment of chest wounds were the first studies undertaken.¹⁷ Studies concerning shock and hemorrhage progressed in such a favorable manner that late in May instruction was begun of classes in resuscitation, and thereafter teaching and investigation were closely associated in this service. With a few interruptions, classes of from 6 to 21 officers were instructed each week until November 1, 1918, the successive courses of lectures and demonstrations being gradually amplified and improved.¹⁷ Members of the classes drawn from the surgical staffs of base hospitals, were organized in resuscitation teams, and when needed they were to be ordered to hospitals at or near the front. This plan was not altogether satisfactory. In many cases the personnel in question could not be released from their units for this purpose and as a result some of the resuscitation teams in forward hospitals had not received the instruction referred to.¹⁷ The teaching staff of the surgical research laboratory also gave instruction monthly to the classes in the sanitary school at Langres.¹⁷

Meanwhile surgical research was prosecuted, some studies of this character being conducted in British hospitals. Research in the treatment of chest wounds was conducted by a team of 6 officers, 2 nurses, and 2 enlisted men.¹⁷ These studies were not completed but certain principles apparently were established and surgical operations simplified accordingly.¹⁷ A project to establish an advance surgical research laboratory where observations could be made on recently wounded men was contemplated but never materialized.¹⁷

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CHAPTER XIV

THE DIVISION OF HOSPITALIZATION

GENERAL OUTLINE OF DEVELOPMENT AND ACTIVITIES

The broader activities of the hospitalization division, especially in so far as they pertained to projects, procurement, and organization of hospitals, general control of the professional services, Medical Department transportation, and evacuation of patients, are described in other chapters of this volume. This chapter has to do only with a general outline of this division's development and activities.

Securing adequate hospital beds was one of the earliest tasks, and continued to be one of the greatest and most difficult of the Medical Department of the American Expeditionary Forces until after the armistice had been signed.¹ That the needs as to hospital beds were met, generally speaking, and that there was always a surplus of several thousand hospital beds, were the results of great effort and the use of all possible expedients to utilize available resources to the utmost.²

The necessity for close cooperation between the Medical Department of the American Expeditionary Forces and the medical services of our Allies, especially France, in the provision of hospital facilities was apparent from the outset.¹ Prior to the arrival of headquarters, A. E. F., the question of hospitals had been taken up with the French Minister of War, and a Medical Department member of the American mission with a medical officer of the French Army had made an extensive inspection trip with a view of determining what French military hospitals might be available and suitable for the American Expeditionary Forces.¹ All Atlantic ports in France were visited and their hospital facilities investigated,¹ so that even before the arrival of our first contingent of troops it was possible for the French to begin work for us on a camp hospital at St. Nazaire, and for the existing French hospitals in the vicinity of that port to be evacuated and prepared for transfer to the American Expeditionary Forces as soon as American personnel became available.¹

After the arrival in France of the chief surgeon, A. E. F., he and the American medical officer above referred to covered almost the same itinerary as that followed in the inspection trip which the latter already had conducted, with a view of locating hospitals and Medical Department supply depots and of procuring immediate facilities for the medical service of the troops then expected.¹

When organization of the chief surgeon's office was amplified, July 28, 1917, the hospital division of that office was charged with all questions that concerned the Medical Department pertaining to the location, procurement, construction, and repair of hospitals, the care and evacuation of sick and wounded, the provision and control of hospital trains, ambulances and barges, and the training of Medical Department personnel.³ The chief of this division was also designated liaison officer between the American and French medical services. The great

majority of Medical Department questions which required negotiation during the early formative period of the American Expeditionary Forces pertained to the procurement of hospitals and the determination of general policies.¹

When the chief surgeon for the line of communications was assigned, July 18, 1917, he was charged with certain duties then carried out by the office of the chief surgeon, A. E. F.⁴ These were to include control of base hospitals, medical supplies and personnel in the line of communications. However, until headquarters, A. E. F., moved, September 1, 1917, from Paris to Chaumont, there was very close contact between the chief surgeons of the American Expeditionary Forces and of the line of communications in matters pertaining to hospitalization as well as other affairs.¹ Thereafter, in so far as hospitals were concerned, the office of the chief surgeon, A. E. F., while located at Chaumont, was more particularly concerned with procurement of facilities and general policies concerning hospitals. Very important parts of this service pertained to the fixation of the bed capacity of base, camp and evacuation hospitals, the determination of the duty personnel required to serve units of each class, the provision of convalescent camps and depots, and the preparation of the plans and specifications for hospital construction.⁵ On the other hand, the office of the chief surgeon, line of communications, was concerned with establishment of fixed hospitals throughout the expanding territory of the lines of communications, the provision for their supply and the control of their administration. When headquarters and the supply and administrative services of the American Expeditionary Forces were reorganized by General Orders, No. 31, G. H. Q., A. E. F., February 16, 1918, the chief surgeon moved with the chiefs of most other administrative staffs to Tours, where his office absorbed that of the chief surgeon, line of communications.¹ Two of the officers who had been identified with the hospitalization division of the chief surgeon's office, A. E. F., remained at Chaumont, one of them being detailed to serve as representative of the chief surgeon with the general staff, the other with the fourth section of that body (with which the representative of the chief surgeon, at G. H. Q., soon identified himself). Another officer was now placed at the head of the hospital division.¹ This division was now charged with general matters pertaining to hospitalization, administration and evacuation, while the medical officers attached to G-4 were charged with the hospitalization of the armies in the field, the location and procurement of sites of fixed hospitals, negotiations with the French Mission, and broad questions of general policy which required action by the general staff.¹ Their activities in these matters conformed to the plans of the hospitalization division of the chief surgeon's office at Tours.¹ This division, as ultimately organized, administered the duties outlined above in the manner shown in in the following schedule:⁶

HOSPITALIZATION AND EVACUATION DIVISION

(Corrected to November 1, 1918)

- A. General administration (one officer).
- B. Procurement and construction section (five officers).
 - Hospital projects.
 - Transfer of hospital and property from French central authorities.
 - Offers of land and buildings for hospital purposes.
 - Leasing of land, buildings; etates des lieux.
 - Hospital plans and construction.
 - Repairs to hospitals.
 - Sanitary appliances, plumbing, water, sewerage, light.
 - Procurement and distribution of tentage.
 - Coordination with engineers, railroad and construction, and quartermaster.
 - Inspection and reports on all included in above items.
 - Reference maps and graphic charts.
- C. Administration and policy section (six officers).
 - Hospitals:
 - Centers.
 - Base.
 - Camp.
 - Convalescent (hospitals and camps).
 - Special.
 - Red Cross (military and homes).
 - Boards:
 - Disability.
 - Classification.
 - General.
 - Inspections:
 - Action on reports.
 - Authorization of.
 - Action on complaints.
 - Instruction:
 - Officers.
 - Enlisted men.
 - Personnel requirements:
 - Medical.
 - Quartermaster.
 - Engineers.
 - Etc.
 - Regulations: General policy of.
 - War diary hospitalization section.
 - Historical record of hospitalization.
 - Coordination of administration with other departments and professional section.
- D. Personnel and equipment; statistical and liaison section (two officers).
 - (1) Daily bed report of base hospitals and convalescent camps.
 - Weekly bed report of all hospitals.
 - Monthly bed and authorization report of all hospitals.
 - Statistical tables.
 - (2) Liaison, chief quartermaster's office reference:
 - (a) Laundries.
 - (b) Bakeries.
 - (c) Fuel.
 - (d) Subsistence.
 - (e) Ranges, stoves, etc., for hospitals.
 - (3) Care of and location of Medical Department units arriving from United States.
 - (4) Installation of new hospitals, initial equipment and supplies.
 - (5) Assembly and shipment of mobile hospitals and mobile surgical units.

E. Evacuation and transportation section (six officers).

Primary, secondary, and special evacuation of sick and wounded.

Collection of evacuees of class D and their assembly at base ports for transfer to the United States.

Transfer and assembly of special classes of patients at special hospitals.

Liaison with Navy Department representatives reference to transfer patients to home ports by Navy transports.

Liaison with French mission reference to disposition American patients in French hospitals.

Liaison with British mission reference to disposition American patients in British hospitals.

Liaison with troop movement bureau reference to routing evacuees from hospitals to casual depots, depot divisions, and regulating stations.

Liaison with armies and general headquarters through representatives at regulating stations.

Records and statistics of evacuations.

Hospitals trains, personnel, supply, inspections and regulations, requirements and specifications, auditing of accounts for purchases and rental.

Motor transportation. Shipments from United States, arrivals and shortages in France, losses, furnishing of transportation and equipment by other agencies.

Records of transportation for identification; registration cards; assignment of motor transportation in Services of Supply and to arriving sanitary trains.

Records of assembling, repairs, maintenance, and storage of equipment. Personnel, supply, inspections and regulations for evacuation ambulance companies.

Service of light, railway, and canal. Construction of cars and appliances for supporting litters. Records of transportation. Obtaining sanitary personnel for this service.

Liaison with railway transport service and Motor Transport Corps and light railway and canal service.

Under the immediate jurisdiction of the hospitalization division, but not actually pertaining to it, was the group of professional consultants at Neufchateau. These consultants supplemented the purely official activities of the hospitalization division by their supervision and direction of the technical, medical, and surgical services rendered the patients in hospital.⁷

Instructions concerning the partitioning of military hospitals into two classes, and the determination of the field of Medical Department responsibility in the control of hospitals under the jurisdiction of the Services of Supply were published, as follows:

Bulletin No. 29.

AMERICAN EXPEDITIONARY FORCES,
HEADQUARTERS, SERVICES OF SUPPLY,
France, August 30, 1918.

1. All hospitals, except evacuation and field hospitals, are hereby designated as S. O. S. (Services of Supply) formations. These hospitals are divided into two classes. The first class includes hospital centers and base or special hospitals disconnected from hospital centers. The second class includes camp or other hospitals serving purely local purposes.

2. Hospitals of the first class have the status of general hospitals and are under the control of the commanding generals of the sections in which they are located only in the matter of discipline, guard, inspection, construction, supply, and fire protection. They are under the direct control of chief surgeon, A. E. F., in all other matters, including general administration, control of personnel, care and evacuation of the sick and wounded, etc.

3. Commanding officers of hospitals of the first class have the responsibility and authority of post commanders in addition to their duty in connection with the general management

of the hospitals. They are authorized to appoint disability boards for the service of their hospitals, as provided in section 1, G. O. 41, G. H. Q., A. E. F., 1918. They are authorized to communicate direct with the American Red Cross convalescent homes and to issue the necessary orders to send cases to such homes, where accommodations are available.

4. They will apply to section commanders for necessary guards. The commander of such guard, if a commissioned officer, will report to the medical officer commanding for instructions as to the character of the guard duty to be preformed and he will exercise no control over the sanitary formation. If the guard be reported by a noncommissioned officer, it will be under the immediate control of the medical officer of the day.

5. Hospitals of the second class, including those serving school areas, are under the control of the commanding generals of the sections in which they are located. This control will be exercised through the surgeon on the staff of the section commander.

6. Supplies for hospitals, except medical supplies, and allotments for repairs will be obtained from headquarters of the section in which the hospital is located. Medical supplies will be obtained by requisition on depots in the manner specified from time to time by the chief surgeon.

By command of Major General Harbord:

JOHNSON HAGOOD, *Chief of Staff.*

Official:

L. H. BASH, *Adjutant General.*

Such of the activities of the American National Red Cross as were conducted in the American Expeditionary Forces and as pertained to military hospitalization and supplies were under the control of G-4.⁵ In the zone of the armies, the hospitals of this society were under the control of G-4-B; i. e., the Medical Department element of the fourth section of the general staff.⁵ When American Red Cross hospitals were taken over by the Army they became part of its effective hospitalization service, and as such were under the supervision of the hospitalization division of the chief surgeon's office.⁵

Though a large number of possible locations for hospitals had been selected prior to the transfer of the chief surgeon's office from Chaumont, the need for others steadily progressed. When the hospitalization division desired further procurement it so notified the chief surgeon's representative at general headquarters.⁵ In discharging this duty, the group with G-4 would learn whether the site proposed had a prior claim upon it either by the French or by another branch of our service; whether railway facilities (e. g., strength of bridges) were such that it was readily accessible by trains carrying patients from the front and by others bringing supplies from the rear; whether the terrain was suitable, if new construction was planned, or whether available buildings were approximately satisfactory if use of such structures was contemplated; whether the water supply was adequate, etc.⁵ Suitability of the terrain had been a factor in the early tentative selection of each site, but this was reexamined when information was received designating definitely the number of buildings that would be necessary for a specific project.⁵

Efforts were made in advance to prepare hospital facilities for arriving troops. To this end surgeons of base sections were directed to make preliminary arrangements for the care of the sick of incoming troops, and to notify surgeons of the same concerning the hospitalization and transportation of their sick pending the establishment of their own infirmaries and camp hospitals.⁸

In order that hospitals might be established and equipped before the arrival of troops, the chief surgeon, A. E. F., notified the assistant chief of staff, G-4,

general headquarters, that he would have to be informed sufficiently in advance as to the training areas to which the troops concerned would go.⁹ He also notified the assistant chief of staff, G-3, that each division surgeon should come to France with the advance party of the division to make the necessary hospital preparation.¹⁰

On request of the hospitalization division to the supply division of the chief surgeon's office, property was shipped to different hospitals without requisition by the commanding officer of the hospital concerned. Such property included equipment for base hospitals,¹¹ complete, crisis expansion equipment,¹² disinfectors,¹³ and a wide range of other supplies and material including tentage.¹¹ Similarly, the hospitalization division made application upon the American Red Cross for a variety of supplies and installations (e. g., portable ice machines)¹⁴ and upon the chief quartermaster for equipment of incoming hospitals with such items as heating stoves,¹⁵ ranges, marmites, hot water reservoirs, cooking utensils, and messing equipment.¹⁶ Its activities extended into great detail for it formulated lists of the quota of heating stoves and cooking ranges necessary for each type of unit, itemized the utensils which should accompany each range,¹⁶ and detailed the equipment of ward diet kitchens,¹⁷ of American Red Cross diet kitchens¹⁸ and specified articles comprising a surgical ward dressing unit,¹⁹ the equipment for a 1,000-bed tent crisis expansion,²⁰ the furniture unit for a tent ward,²¹ the furniture unit for a ward containing normal beds,²² and prescribed in explicit detail the character and quantity of all supplies authorized for each of the different types of hospitals and for each department of a hospital. It supervised the organization, selection and provision of equipment for mobile hospitals, mobile surgical units and other newly created and specialized hospital agencies, as well as of the base or camp hospitals discharging their usual service, procured authorization for convalescent camps and prescribed their organization, equipment and operation.²³ It notified the division of laboratories of the arrival and assignment of base hospitals in order that the division of laboratories might make appropriate contact with the respective laboratory services.²⁴ Some hospitals were assigned to the service of particular classes of cases, such as cases of psychoneurosis, tuberculosis, bone and joint, cranial and maxillofacial injuries.²⁵ The proper selection of specialist personnel for assignment, their supervision and the procurement and distribution of technical equipment were essential in order that satisfactory results might be attained in the treatment of patients.²⁵ That part of the Medical Department which was charged with the professional care of patients was under control of the hospitalization division.²⁶ It was also necessary that special foodstuffs be provided and that personnel and equipment suitable for their preparation be furnished.²⁷ The provision of labor, fuel, pure water, illumination, and transportation were a few of the other interests of the hospital service throughout the American Expeditionary Forces. The hospitalization division was thus charged with the provision of hospital needs, for their satisfaction, the utilization of resources to the best advantage, and general administration of the service of hospitalization and evacuation.²⁷ The fact that over three thousand items were listed among the supplies required by the Medical Department (most of these pertaining to its hospital service) illustrated the highly technical character of the professional services rendered.²⁷

The hospital division of the chief surgeon's office, A. E. F., conducted its general administration by means of instructions which were incorporated in circulars, circular letters and memoranda from the chief surgeon's office, and by telegrams, letters or telephone conversations with the parties interested. Inspections were conducted by general inspectors, by members of the hospitalization and finance divisions of the chief surgeon's office and by the professional consultants.²⁸ Information was also disseminated by the *Weekly Bulletin* published by the chief surgeon's office.²⁸ Special inspectors constantly visited the hospitals to instruct the inexperienced in military methods of administration, to secure the formulation of more accurate reports, and to improve all elements of the service discharged by those units.²⁹

The gravest difficulty which the hospitalization division experienced arose from the lack of adequate personnel for fixed hospitals. As stated in Chapter V of this section, base hospitals were stripped of all available officers, nurses, and men to form operating and other teams for service in the zone of the armies and to staff the camp hospitals. Provision of personnel for the last mentioned units, the chief surgeon declared, was the most difficult problem of the Medical Department in the American Expeditionary Forces.³⁰

The hospitalization division compiled two consolidated bed reports, a weekly report³¹ and a daily report.³² Both of these were based upon telegraphic reports of bed status (number of designated beds, both normal and crisis expansion, and occupied and vacant) received from the various stationary hospitals in the Services of Supply. The purpose of the weekly consolidated report was to have at hand, not only for the chief surgeon but also for headquarters, Services of Supply, and headquarters, general headquarters, a complete statement of the hospital bed situation, in order that the necessity for the additional provision of hospital beds could be foreseen.

The hospitalization division did not require at first that bed reports of field hospitals when operating as purely divisional units be submitted to the chief surgeon's office direct.³² Later it was required that weekly bed reports be telegraphed by field and evacuation hospitals, direct to the chief surgeon's office, and a form for this was prescribed.³³ Weekly telegraphic bed reports were required of the chief surgeons of the several armies.³⁴ Considerable difficulty was experienced in the effort to keep a correct, consolidated report of the hospitals attached to combat units; consequently, on September 21, 1918, the chief surgeon requested his representative with the general staff to notify him of changes of status of all hospitals attached to combat units.³⁵ Frequently units, such as field, evacuation, and mobile hospitals, arrived in France, opened, closed, and combined, etc., without word being received by the chief surgeon's office.³⁵ The chief surgeon's representative at general headquarters replied to the effect that in time of active operations compliance with the above instructions would be very difficult largely because of the difficulties of communication between the division and corps surgeons and the latter officers and the army surgeon. Positive orders of general headquarters prohibited telephoning or telegraphing any information concerning a military location except in code, and code books were not supplied to any unit smaller than a regiment. The chief surgeon's representative stated further that this information would undoubtedly be

furnished when the organization became a smoother working machine, but that it would have to be supplied by mail, which was a very uncertain method of communication.³⁶

In the late spring of 1918, when our Medical Department took over from the French the medical service to the rear of our combat divisions,⁵ the necessity arose for having at hand a constantly corrected record of the hospital bed situation. The hospitalization division of the chief surgeon's office not only had to assign to a regulating station a definite number of beds for casualties being evacuated from the front, but also must know to which hospitals farther to the rear patients in hospitals nearer the front could be cleared. Obviously weekly telegraphic reports from hospitals would be totally inadequate for the purpose; consequently, daily bed reports now were required from all stationary hospitals in a manner similar to that in which the weekly reports were made.³² It was this daily report of the bed situation in the hospitals of the Services of Supply, with which the evacuation section of the hospitalization division was most concerned.

On the date the armistice was signed the hospitalization division included 41 per cent of the 61 officers then on duty in the chief surgeon's office, a fact which illustrates the relative extent of its activities.³⁶

After the signing of the armistice the hospitalization division was concerned chiefly with the cancellation of projects, the transfer of patients to base ports for evacuation to the United States, the closure of hospitals, and the storage of hospital equipment and supplies.³⁷

The hospitalization activities of the chief surgeon's office, A. E. F., were continued along the lines outlined above until the American Expeditionary Forces were succeeded first by the American forces in France and then by the American forces in Germany.³⁰

PERSONNEL ^a

(July 28, 1917, to July 15, 1919)

Brig. Gen. James D. Glennan, M. C., chief.

Col. John L. Shepard, M. C., chief.

Col. Sanford W. Wadhams, M. C., chief.

PROCUREMENT AND CONSTRUCTION SECTION

Col. James D. Fife, M. C., chief.

Col. Arnold D. Tuttle, M. C., chief.

Lieut. Col. Rolf Floyd, M. C.

Capt. John A. P. Millett, M. C.

Capt. Martin D. Mims, San. Corps.

Capt. Harold Rich, San. Corps.

Capt. Donald V. Trueblood, M. C.

First Lieut. Garrett S. De Grange, jr., San. Corps.

First Lieut. Peter A. Lelong, San. Corps.

First Lieut. George E. Russell, San. Corps.

^a In this list have been included the names of those who at one time or another were assigned to the division during the period July 28, 1917, to July 15, 1919.

There are two primary groups—the heads of the division or the section and the assistants. In each group names have been arranged alphabetically, by grades, irrespective of chronological sequence of service.

ADMINISTRATION AND POLICY SECTION

Col. Frederick P. Reynolds, M. C., chief.

Col. John L. Shepard, M. C., chief.

Lieut. Col. Leartus J. Owen, M. C., chief.

Col. Shelley V. Marietta, M. C.

Maj. Earnest L. Scott, San. Corps.

PERSONNEL AND EQUIPMENT; STATISTICAL AND LIAISON SECTION

Col. Thomas H. Johnson, M. C., chief.

Lieut. Col. Lucius L. Hopwood, M. C., chief.

EVACUATION AND TRANSPORTATION SECTION

Col. Robert M. Culler, M. C., chief.

Col. George P. Peed, M. C., chief.

Col. Frank W. Weed, M. C., chief.

Lieut. Col. Howard Clarke, M. C.

Capt. James E. Barney, San. Corps.

Capt. Joseph E. Murray, San. Corps.

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- (7) Report from Col. W. L. Keller, M. C., director of professional services, A. E. F., to the chief surgeon, A. E. F., December 31, 1918. Subject: Brief outline of the organization and activities of the professional services between April, 1918, and December, 31, 1918. On file, Historical Division, S. G. O.
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- (13) Letter from the chief surgeon, A. E. F., to commanding officer, Camp Hospital No. 27, August 5, 1918. Subject: Replacement of Quartermaster Department disinfectors, On file, World War Division, A. G. O., chief surgeon's files (322.32911.)
- (14) Letter from the chief surgeon, A. E. F., to the chief of Army Transport Service, June 8, 1919. Subject: Request shipment of portable ice machines. On file, A. G. O., World War Division, chief surgeon's files (322.32911.)
- (15) Letter from the chief surgeon, A. E. F., to the chief quartermaster, A. E. F., July 5, 1918. Subject: Heating stoves. On file, A. G. O., World War Division, chief surgeon's files (414.2).
- (16) Letter from the chief surgeon, A. E. F., to the chief quartermaster, A. E. F., May 31, 1918. Subject: Equipment. On file, A. G. O., World War Division, chief surgeon's files (414.2).
- (17) Equipment of ward unit, diet kitchens (undated). On file, A. G. O., World War Division, chief surgeon's files (414.2).
- (18) Red Cross diet kitchen equipment list (undated). On file, A. G. O., World War Division, chief surgeon's files (414.2).
- (19) Memorandum from chief of hospitalization division, chief surgeon's office, A. E. F., to chief of supply division, June 19, 1918. Subject: List of articles comprising a surgical ward dressing unit. On file, A. G. O., World War Division, chief surgeon's files (442).
- (20) List showing "Equipment to be ordered for 1,000 beds-tent crisis expansion, 24 wards." On file, A. G. O., World War Division, chief surgeon's files (440.1).
- (21) "Furniture unit for a tent ward." On file, A. G. O., World War Division, chief surgeon's files (440.1)1.
- (22) "Furniture unit—ward." On file, A. G. O., World War Division, chief surgeon's files (440.1).
- (23) Statement based on general correspondence concerning hospitalization. On file, A. G. O., World War Division, chief surgeon's files (322.32911).
- (24) Report from Col. J. F. Siler, M. C., director of laboratories and infectious diseases, to the chief surgeon, A. E. F. (undated). Subject: Activities of the division of laboratories and infectious diseases, from August, 1917, to July, 1919. On file, Historical Division, S. G. O.
- (25) Report of the activities, hospital center, Vichy; also, report of the activities of Base Hospital No. 117, prepared under the direction of the respective commanding officers (undated). On file, Historical Division, S. G. O.
- (26) Schematic chart of Medical Department organization, A. E. F. Approved by the commander in chief, A. E. F., March 6, 1918. On file, Historical Division, S. G. O.
- (27) Report from the chief surgeon, A. E. F., to the commanding general, A. E. F., April 17, 1919. Subject: The Medical Department, A. E. F., to November 11, 1918. On file, Historical Division, S. G. O.
- (28) Statement based on circulars, circular letters, and weekly bulletins, published by the chief surgeon's office, A. E. F. On file, Historical Division, S. G. O.
- (29) Report from the chief surgeon, A. E. F., to the commanding general, A. E. F. (undated), Subject: Outline report of chief surgeon, A. E. F. Copy on file, Historical Division, S. G. O.
- (30) Report from the chief surgeon, A. E. F., to the Surgeon General, U. S. Army, May 1, 1919. Subject: Activities of the chief surgeon's office, A. E. F., to May 1, 1919. On file, Historical Division, S. G. O.
- (31) Letter from the chief surgeon, A. E. F., to the commanding officers of base, camp, and Red Cross hospitals, May 17, 1918. Subject: Weekly bed reports. On file, A. G. O., World War Division, chief surgeon's files (632.1).

- (32) First indorsement, from the chief surgeon, A. E. F., to commanding officer, 164th Field Hospital Co., June 20, 1918; on letter from the commanding officer, 164th Field Hospital Co. to the chief surgeon, A. E. F., June 16, 1918. Subject: Daily report of patients in hospital. On file, A. G. O., World War Division, chief surgeon's files (632.1).
- (33) Letter from the chief surgeon, A. E. F., to the chief surgeon, Third Army, January 17, 1919. Subject: Weekly telegraphic bed reports. On file, A. G. O., World War Division, chief surgeon's files (632.1).
- (34) Letter from the chief surgeon, A. E. F., to chief surgeon, First Army, January 17, 1918. Subject: Weekly telegraphic bed reports. On file, A. G. O., World War Division, chief surgeon's files (632.1).
- (35) Memorandum from the chief surgeon, A. E. F., to Col. S. H. Wadhams, M. C., G-4, G. H. Q., A. E. F., September 21, 1918. Subject: Information regarding change of status of hospitals. On file, A. G. O., World War Division, chief surgeon's files (320.23).
- (36) Memorandum from Col. S. H. Wadhams, M. C., to the chief surgeon, A. E. F., September 30, 1918. Subject: Information regarding change of status of hospitals. On file, A. G. O., World War Division, chief surgeon's files (320.23).
- (37) War diaries, chief surgeon's office, November 16, 1918, to June 30, 1919.
- (38) Report of the Medical Department activities of the Third Army (undated), by Col. J. C. Grissinger, M. C.; also, letter from the chief surgeon, A. F. in F., to the commanding general, A. F. in F., December 30, 1919. Subject: Report from July 1 to December 31, 1919. Both on file, Historical Division, S. G. O.

CHAPTER XV

THE DIVISION OF HOSPITALIZATION (Continued)

HOSPITAL CONSTRUCTION; PROCUREMENT

CONSTRUCTION

Despite the possibility of procuring from the French certain buildings that could be adapted to hospital purposes, it was apparent to the Medical Department, A. E. F., from the outset that these would have to be supplemented by new construction.¹ Even before the arrival of headquarters, A. E. F., the erection of a barrack hospital was commenced in the debarkation camp at St. Nazaire.¹

An important factor in expediting the development of our needs in this matter was the fact that the French did not have in the training areas which they were to turn over to our troops sufficient hospitalization to meet our needs, and it quickly became essential that we then construct buildings of our own.² A set of plans for a large hospital of barrack type had been sent to France when the staff of the American Expeditionary Forces went overseas, but these were found to be wholly impracticable.² The ground plan of the unit as defined by the War Department called for three times as large an area as did the plans eventually adopted for a unit with the same number of beds in the American Expeditionary Forces. Also, it prescribed porches, a sewerage system, extensive plumbing and heating appliances and other features which could not have been realized with the limited resources available in France. Neither lumber nor the labor necessary for their construction were procurable overseas.² Accordingly, as soon as it was ascertained that the plans prepared by the War Department could not be utilized, an assistant to the chief surgeon, A. E. F., after collecting suggestions from various medical officers commanding base hospitals of the American Expeditionary Forces, formulated plans for construction and layout which were more compatible with our resources.¹ Many of the good features that had been developed by our Allies were incorporated in the plans which he developed, but he also considered in their formulation the general layout of the Letterman General Hospital in San Francisco. The plans now formulated were made the basis of hospital construction in the American Expeditionary Forces.

PLANS FOR A BASE HOSPITAL, TYPE A

The plan for the layout and for the buildings to be erected for each base hospital, whether located separately or in conjunction with others, was designated that of a type A unit.³

To conserve wear and tear on personnel and to facilitate administrative control, the area to be covered by these hospital units was reduced to a minimum, consistent with safety from fire.² To economize in heating, lighting, structural material, etc., and to centralize and standardize the units, only 20

feet of space was allowed between most of the buildings. From an administrative and clinical standpoint this concentration proved preferable, and, though it increased the fire risk, not a single serious fire occurred in any of these units.²

The type A unit required a frontage of 850 feet and a similar depth, its normal layout comprising 3 rows of buildings, divided by suitable intercom-

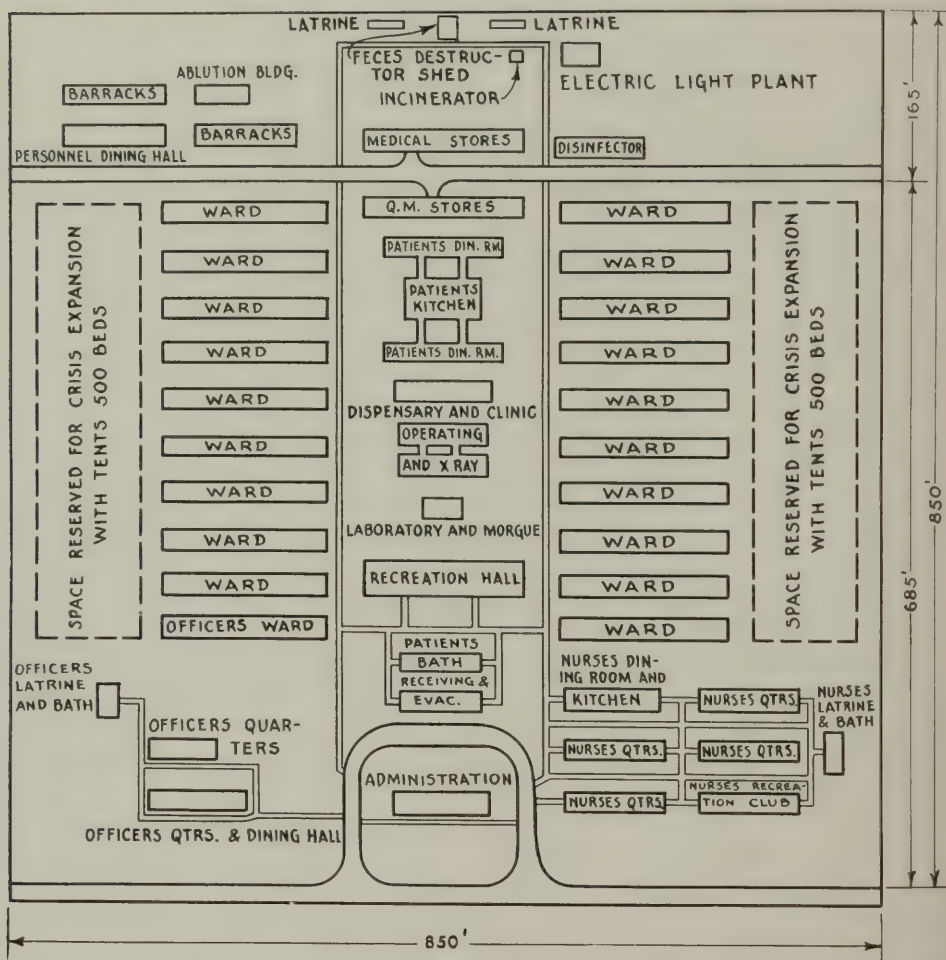


FIG. 21.—General layout of hospital unit, type A (base hospital), with wards 20 feet wide. Demountable buildings. In a hospital center one recreation hall and one disinfectors were provided for each two hospital units; the nurses' recreation club was omitted when a central nurses' recreation club was provided

municating roadways and walks.⁴ The central row of buildings included those pertaining to general service such as administration, reception of patients, baths, operating and X-ray section, clinic, and dining room. On each side of this central row of buildings was a block of 5 or 10 wards, dependent upon their size, and in rear of these sufficient space for the erection of tents, the crisis expansion, which in prolongation of the several wards would provide additional bed capacity in emergencies.

In the type A unit the ward buildings were of two sizes;⁴ the scarcity of building material, and the different contracts made it necessary to have in one part of France buildings entirely different from those in another part.⁵ Thus the dimensions of one ward used was 20 by 164 feet; of another, 36 by 156 feet. The number of patients per ward varied, of course, with its size, normally being about 50 for the narrower ward and double that number for the wider one. In addition, the wards provided space for the necessary administrative,

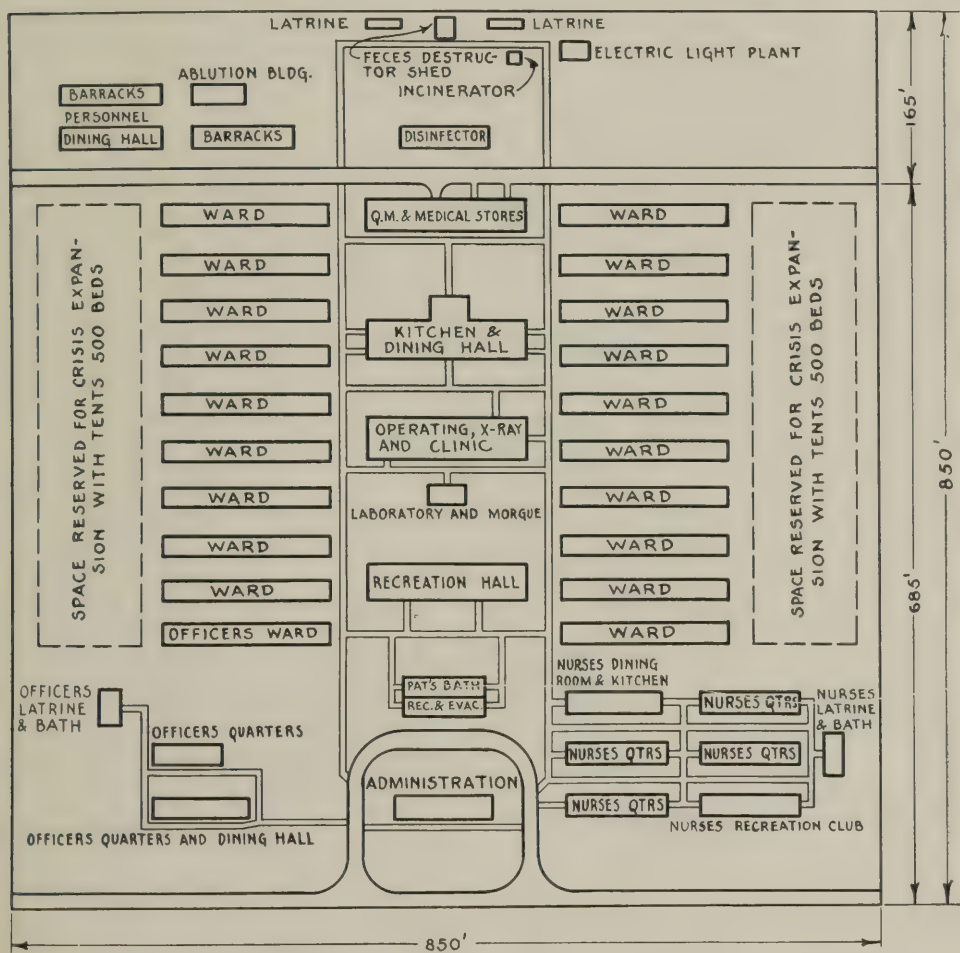


FIG. 22.—General layout of hospital unit, type A, with wards 20 feet wide. Permanent buildings. In a hospital center one recreation hall and one disinfectant were provided for each two hospital units; the nurses' recreation club was omitted when a central nurses' recreation club was provided

culinary and toilet facilities. Twenty of these buildings (10 when the wider wards were used), half being on each side of the central administrative or clinical group, provided accommodations for 1,000 patients, the normal capacity of these units. Extension of each ward by tentage, the crisis expansion, doubled this capacity, and gave accommodations for 1,000 emergency beds. In the corners of the general plan were located the quarters of the officers, nurses, enlisted men and accommodations for the isolated or psychiatric cases.³

Originally the plans for type A units provided for a recreation hall in the central row of buildings, and a space had been designed for such a structure. The American Red Cross undertook to install, equip, and operate these buildings, and in the fall of 1917 sent to France 5,000,000 feet of lumber for this and other purposes.² Building material, however, was so scarce that the general staff, A. E. F., requested the American Red Cross to transfer this material to

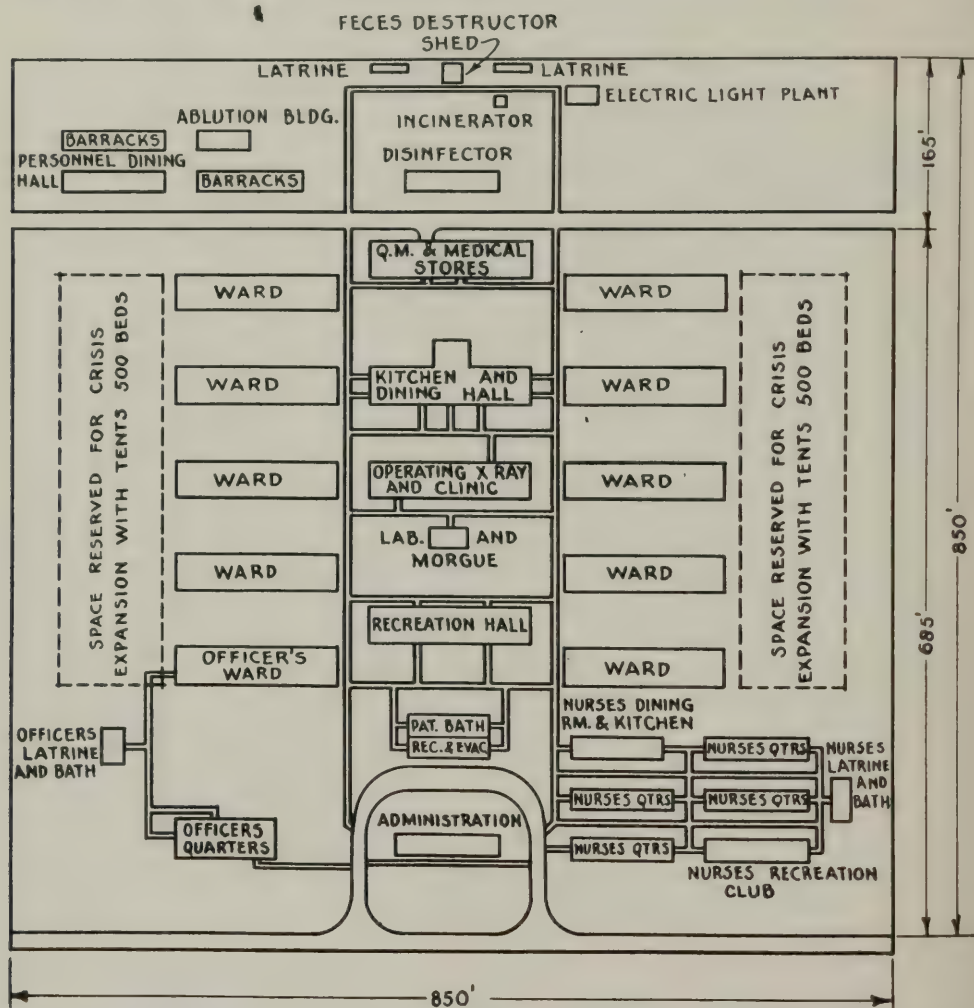


FIG. 23.—General layout of hospital unit, type A, with wards 36 feet wide, 156 feet long. In a hospital center one recreation hall and one disinfector were provided for each two hospital units; the nurses' recreation club was omitted when a central nurses' recreation club was provided

the American Expeditionary Forces, engaging itself to construct these buildings from material that would be obtained later.² This created a regrettable situation, because at no time did sufficient material become available for the American Expeditionary Forces to fulfill this obligation.² Accordingly when the American Red Cross realized that fact, it again undertook the provision of recreation buildings, construction being effected by the engineers, but, when hostilities ceased many hospital units lacked their authorized recreation huts.²

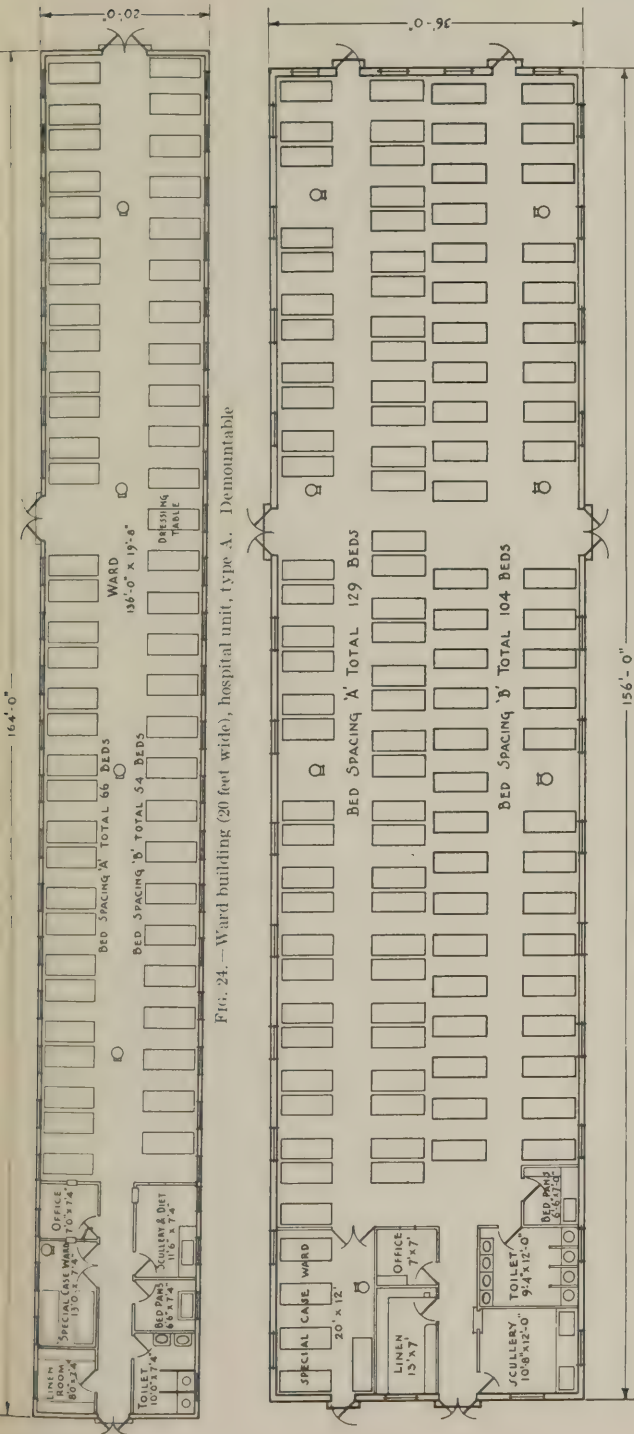
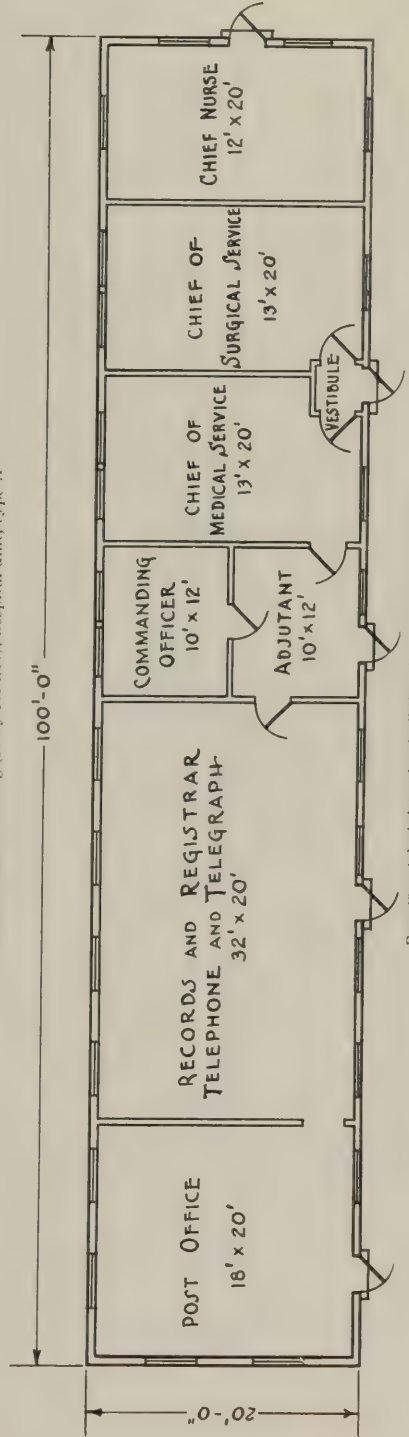


FIG. 25.—Ward building (36 by 156 feet), hospital unit, type A



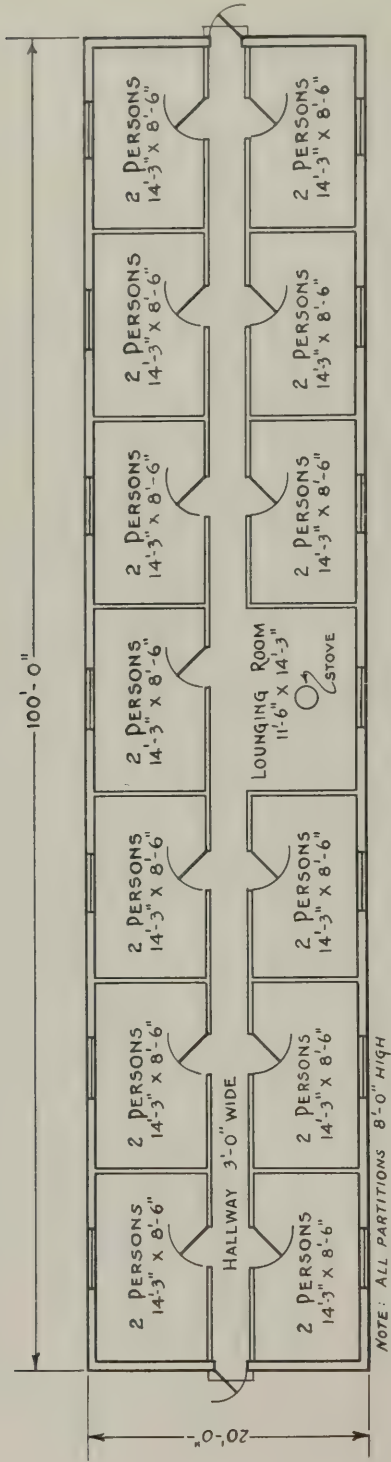


FIG. 27.—Nurses' quarters, hospital unit, type A

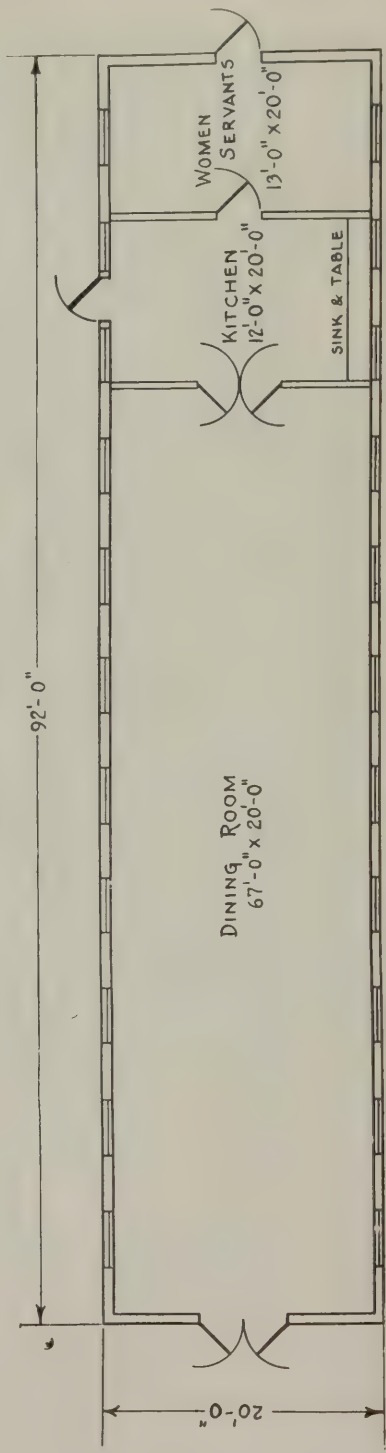


FIG. 28.—Nurses' dining room and kitchen, hospital unit, type A; for use with demountable buildings

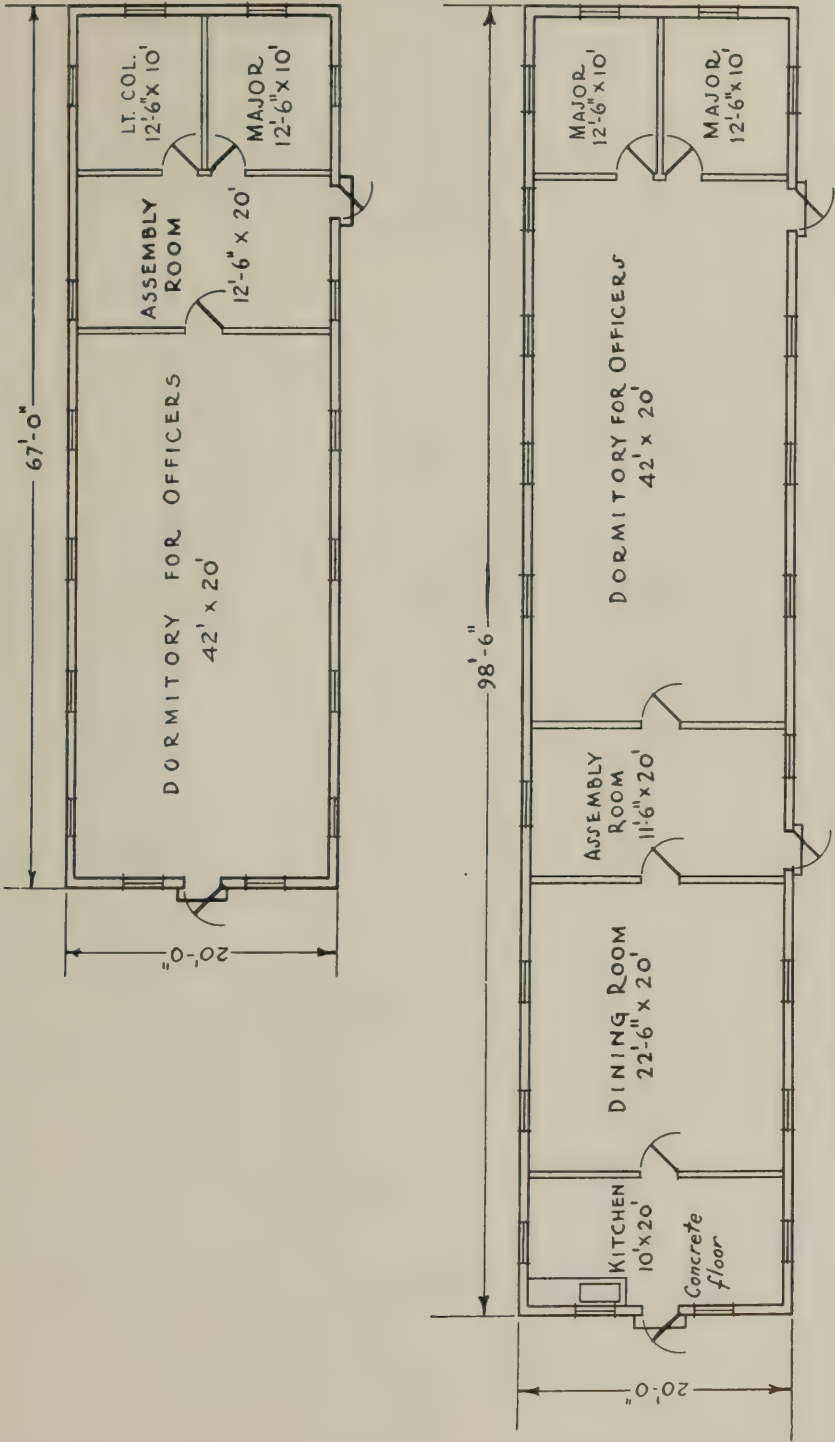


FIG. 29.—Officers' quarters and dining room, hospital unit, type A; for use with demountable buildings

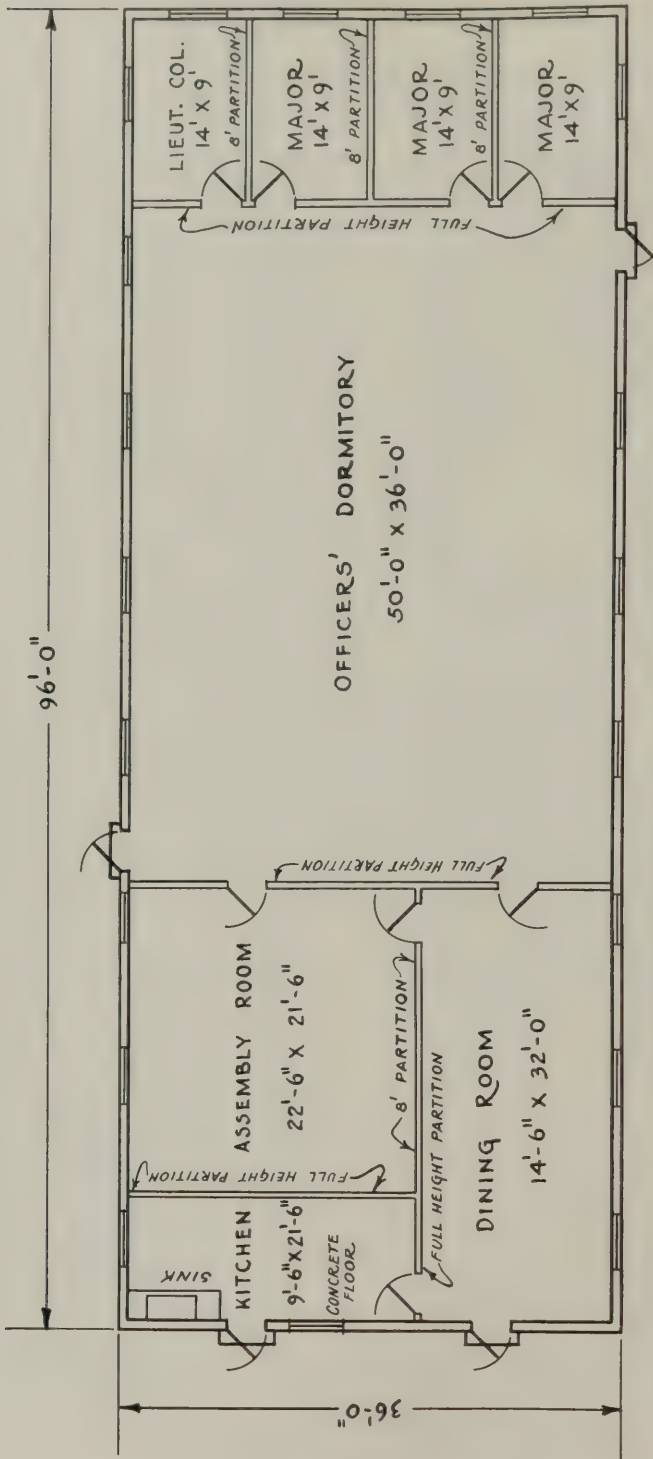


FIG. 30.—Officers' quarters, hospital unit, type A; for use with permanent type of buildings

This was a graver matter than might at first appear, for, in the absence of legitimate diversions otherwise obtainable, the facilities of the recreation buildings had a noteworthy influence in promoting the morale of the hospital.

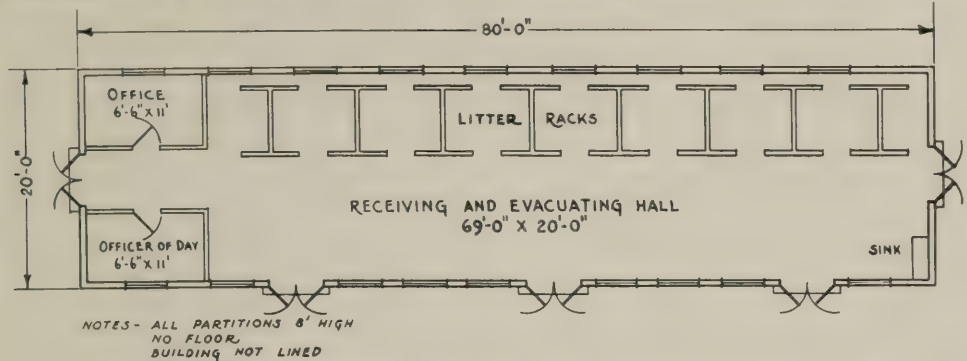


FIG. 31.—Receiving and evacuating hall, hospital unit, type A; for use with demountable buildings

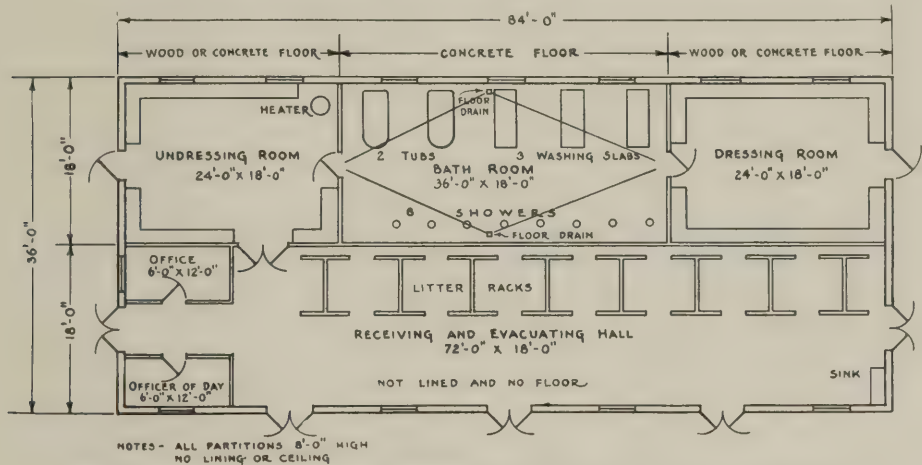


FIG. 32.—Receiving and evacuating hall and patients' bath, hospital unit, type A. Permanent type

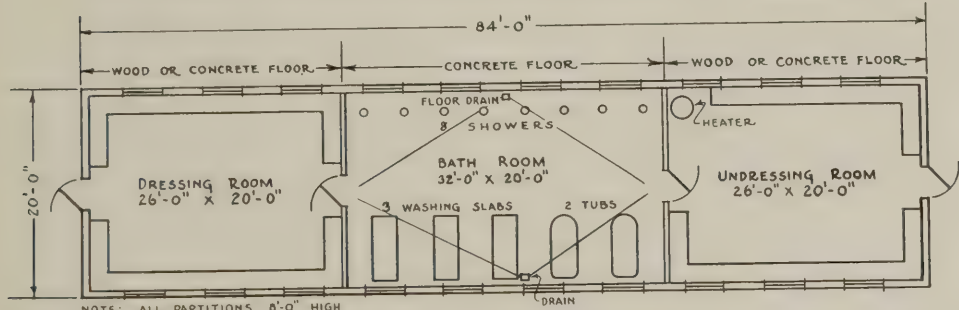


FIG. 33.—Patients' bath, hospital unit, type A; for use with demountable buildings. Permanent type is shown in Figure 32

In order to standardize and simplify construction, each hospital was designed on the principle of using only portable wooden huts with floor dimensions of 20 by 100 feet, or any huts built of other materials but approximating these dimensions and obtainable in Europe.² These standard units as designed were complete in every particular.¹ Most of the type A hospitals were built of wood. Some, where local resources permitted, were superior, and, especially

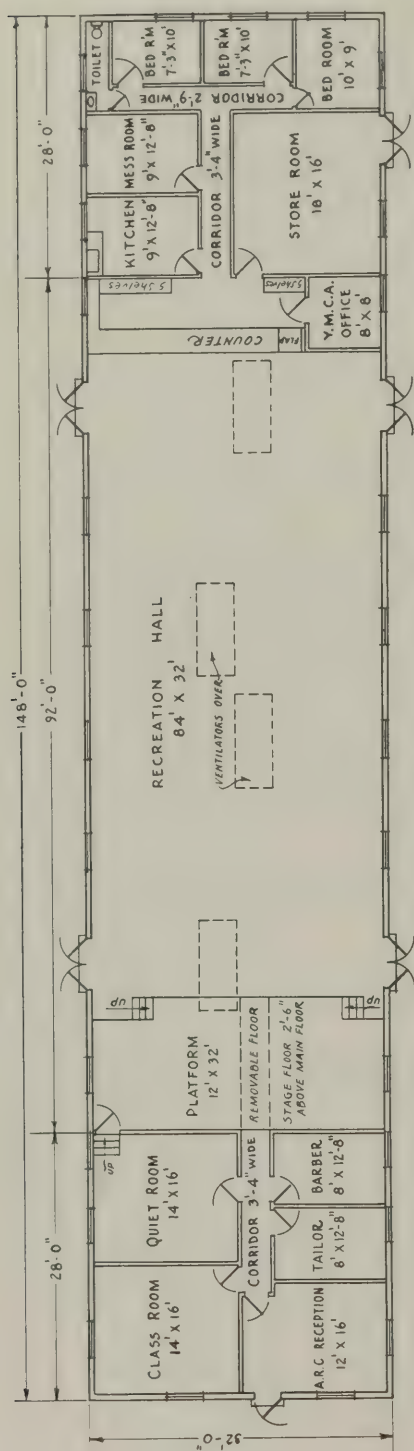


FIG. 34.—Recreation hall, hospital unit, type A; permanent building type

in those units constructed by English or French contractors, tile, brick, sheet steel, and concrete were frequently used.² The buildings that were made of wood or sheet steel (Adrian barracks) were composed of unit mill-fabricated sections 10 feet high and $8\frac{1}{3}$ feet wide, each side of the average buildings which had a length of 100 feet comprising 12 sections. These sections consisted of side frames and roof trusses to which, when set up, the walls and roof panels were bolted. They were bolted together while flat on the ground, then raised to a vertical position and temporarily secured until the side and roof panels had been bolted. The wall panels, 10 feet long and $4\frac{1}{6}$ feet wide, were provided with exterior and interior board walls, the latter having a smooth finish. Roofs consisted of boards covered with tar paper; floors and ceilings, of planks. The windows, though adequate, were comparatively small, for glass was scarce and substitutes frequently were necessary. Among these substitutes for glass were plain or oiled cotton fabrics, and an isinglass preparation on thin wire mesh. The isinglass preparation proved unsatisfactory in the damp climate of France.² The first type A hospital, which was at Bazoilles, was reported as one-third completed in December, 1917.²

The component parts of the huts were interchangeable and were so divided that it was possible by adding sections to erect a building of any length desired; for example, ward buildings in the type A unit measuring 20 by 164 feet.^{2,4} Changes in width were made with more difficulty but could be effected by an adjustment of paneling or by doubling up buildings. Considerable latitude was thus possible in the dimensions of buildings.

Erection of these huts was relatively simple and, if the military situation so required, they could be taken down (no nails having been used in the assemblage of the component parts), shipped and reerected on another site in a minimum space of time.² They left much to be desired, when compared with permanent structures, but met requirements, though the great scarcity of lumber frequently necessitated the use of green timber which resulted in some warping of the walls.² The great advantages which structures of this type presented were availability, mobility, quickness of erecting, and low initial cost. The

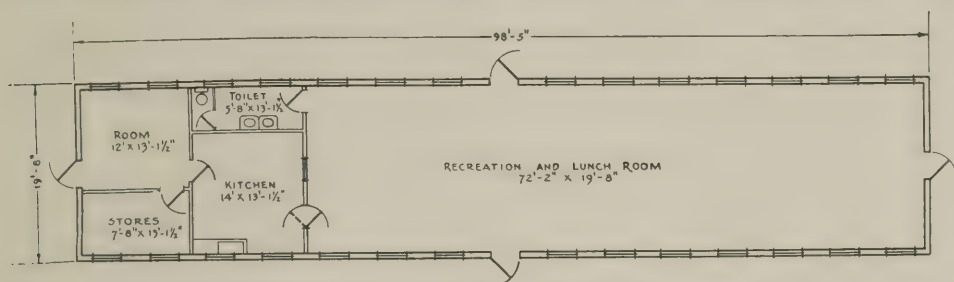


FIG. 35.—Nurses' recreation club, hospital unit, type A; demountable

average price paid for them was \$2,000. These huts, frequently called barracks, had been in use among the armies in France and had proven satisfactory.² They became the backbone of our hospitalization program.

In order to preserve symmetry and to facilitate assembly it was prescribed that as far as possible huts should all be of similar design and of the same dimensions in any one unit. The demand for these structures gradually became so great that it was necessary to comb every available European market for building materials for them, and, as a result, a half dozen different materials for hospital huts eventually came into use.² Of whatever material they were built the huts had the same design and dimensions as those prescribed for the portable wooden huts.

Soon after the Medical Department began its construction program general headquarters, A. E. F., was confronted by a severe shortage in the building material necessary for its many construction projects.² Accordingly, in an effort to retrench, it reexamined the plans for hospitals and other buildings and ordered a reduction in the space allowed for living quarters of officers, nurses, and enlisted men.⁶ The chief surgeon's office acceded to this reduction except in so far as it affected nurses.² Though it strenuously opposed diminution of the modest allowance that had been made for them, this reduction in their quarters was enforced until April, 1918,⁷ when one room, 10 by 14 feet, was allowed for each 2 nurses. Covered passageways connecting wards, clinical buildings and dining rooms were eliminated as mentioned above, but

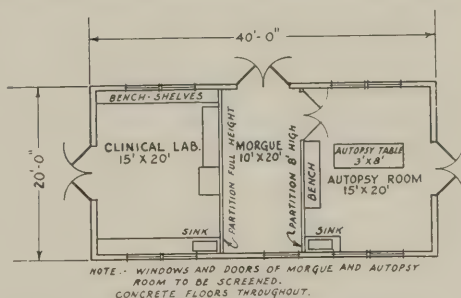


FIG. 36.—Laboratory and morgue, hospital unit, type A; for use with demountable buildings

the plans successfully resisted further pruning except where the units were grouped in centers. Certain further reduction was then possible; for example, some of the psychiatric or isolation buildings were eliminated and the general staff strongly advocated elimination also of unit administration buildings and storehouses.² Fortunately it receded from this position, otherwise it would have been impossible promptly to equip the frequent drafts of outgoing patients.²

As discussed below, under procurement, the French were primarily charged with coordination of construction, several agencies often seeking the same site.² After the approval of the French had been received for the construction of a project, the chief surgeon recommended to the assistant chief of staff,

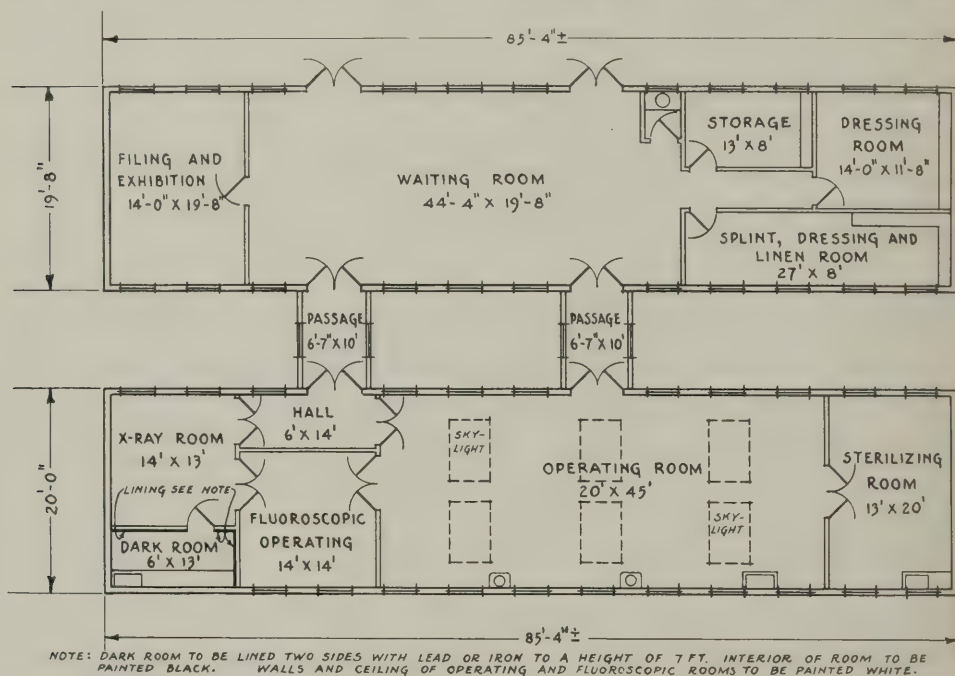


FIG. 37.—Operating and X-ray building, hospital unit, type A. This plan was adopted December 15, 1917, and was to be used only when demountable buildings were to be used. The permanent type is shown in Figure 38

G-4, general headquarters that such construction be effected. The latter then directed the commanding general, Services of Supply, to proceed with construction of a designated number of hospital units at a certain place. The Engineer Corps then proceeded with the construction, much of this being effected, under engineer control by civilian contractors. Even when buildings were taken over from the French it was almost always necessary to have extensive additions, repairs or alterations made before they were suitable for our hospital use.²

During the early period of our hospital construction it was necessary to secure from the French a promise that their Engineer Corps would construct the necessary railroad sidings and loading quais.² In view of their shortage of man power and matériel, such promises were difficult to obtain. On the whole, however, without the assistance at this time of the French, who took

immediate and actively helpful interest in the prosecution of our program, we would have experienced great difficulty in having ready sufficient hospitals to shelter the large number of wounded of the following summer and fall.² As it was, very few of our barrack hospitals were ever entirely finished.² It was necessary to occupy them long before the construction work was completed and wounded were moved into the wards when these furnished little more than protection from the elements.¹ During the warm weather this situation was not serious, but after cold weather came on it was only the early termination of hostilities that prevented very great suffering: Thousands of casualties were sheltered in unfloored and unheated tents.¹ The personnel of base and camp hospitals frequently assisted in the building or modification of the structures which their respective units utilized and continued to perform this work even after patients were admitted. Convalescent patients and, later, labor troops also assisted and were an important factor in the efforts to overcome the shortage of civilian labor.² The situation was fraught with great anxiety to those charged with the provision of hospital accommodations for the rapidly increasing numbers of casualties, but in view of the difficulties encountered it was not surprising that the construction program was never fully realized.¹

PLANS FOR HOSPITAL CENTERS

The necessity for doubling, or in emergencies quadrupling, the size of a base hospital with relatively small increase in the number of the personnel serving the unit, suggested that further economies might be made by grouping these organizations into hospital centers.² Though the expedient offered many advantages the

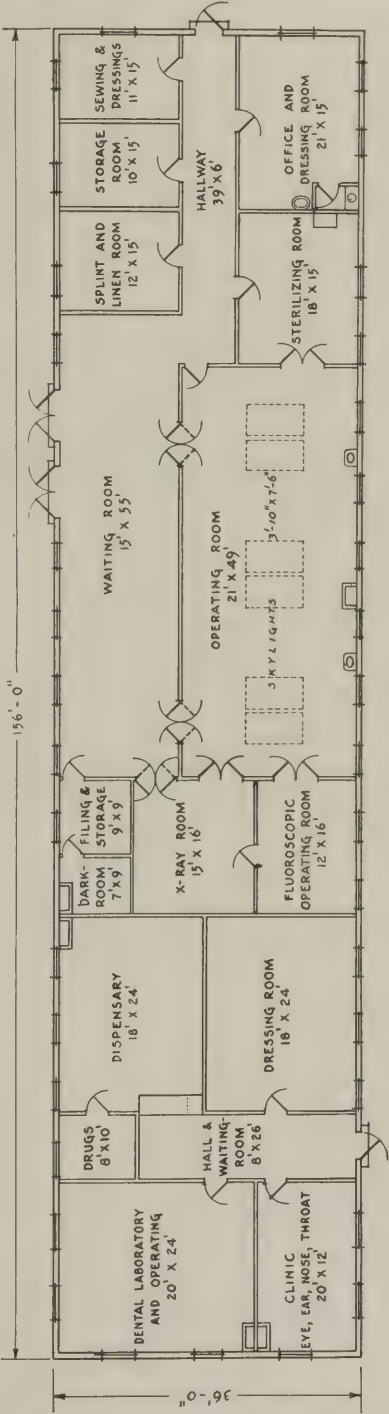


FIG. 38.—Operating, X-ray, and clinic building, hospital unit, type A. This plan, adopted August 12, 1918, superseded the plan of December 15, 1917, shown in Figure 37. When one type A unit only was constructed, this plan was used; however, when two or more units were constructed at a hospital center, this plan and the plan shown in Figure 40 were alternated.

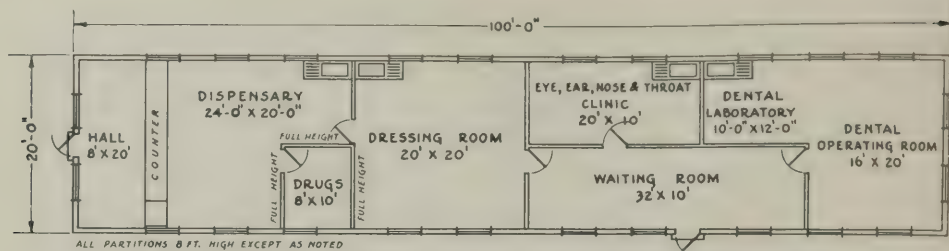


FIG. 39.—Dispensary and clinic building, hospital unit, type A; to be used for demountable building only

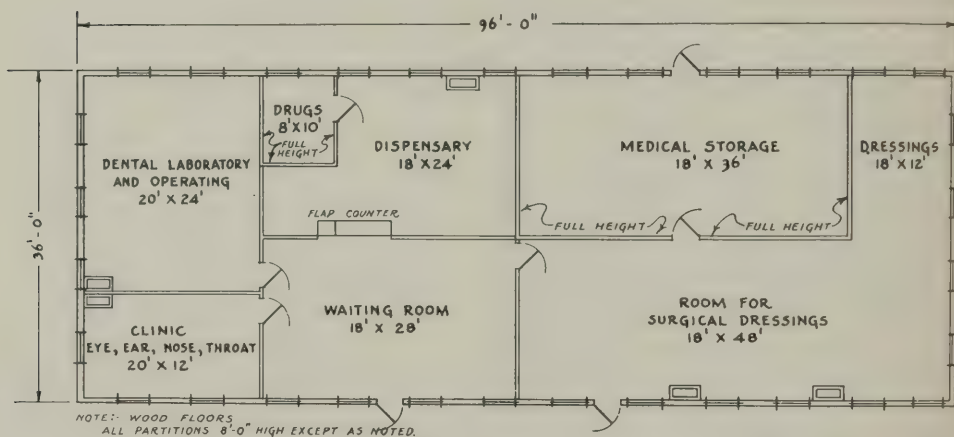


FIG. 40.—Clinic and surgical dressings building, hospital unit, type A. This building was to alternate with the operating X-ray, and clinic building shown in Figure 38; that is, when there were more than one type A unit in a hospital center, half were to have buildings according to this plan, and half according to the plan shown in Figure 38

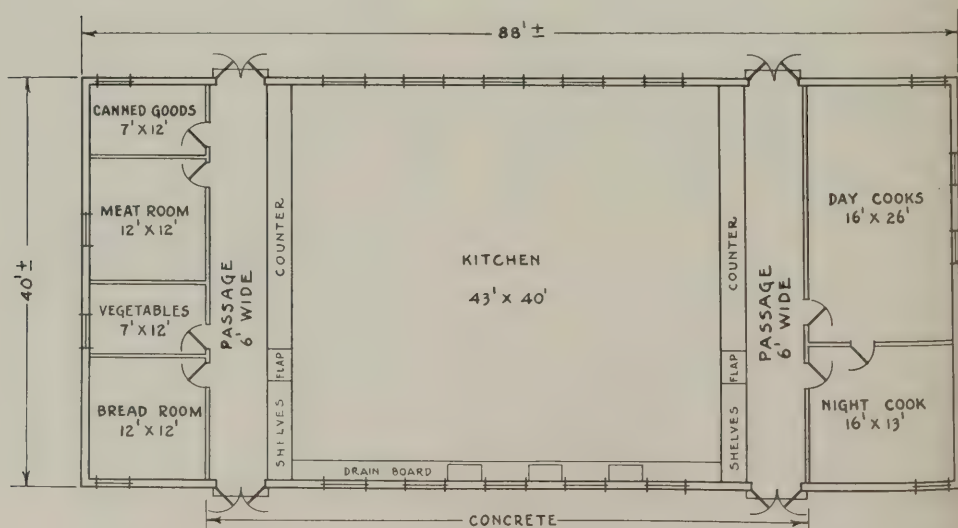


FIG. 41.—Patients' kitchen, hospital unit, type A. Temporary type

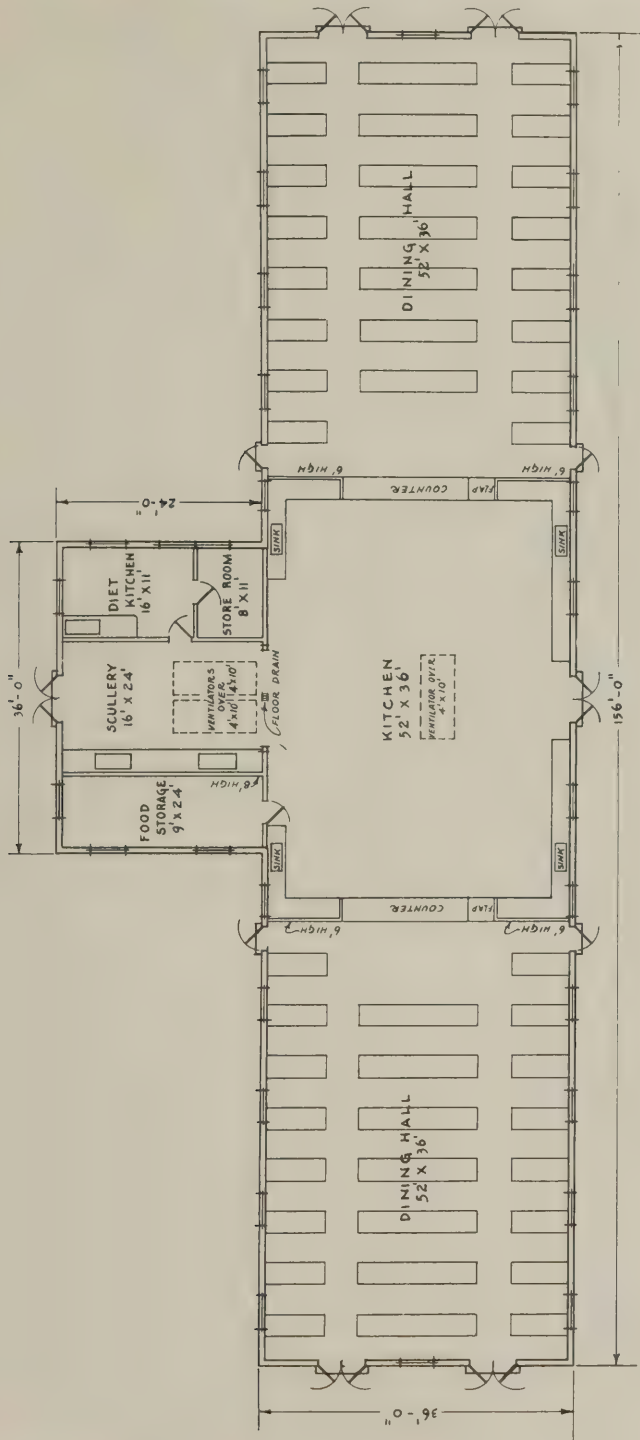


FIG. 42.—Patients' kitchen and dining halls, hospital unit, type A, Permanent type

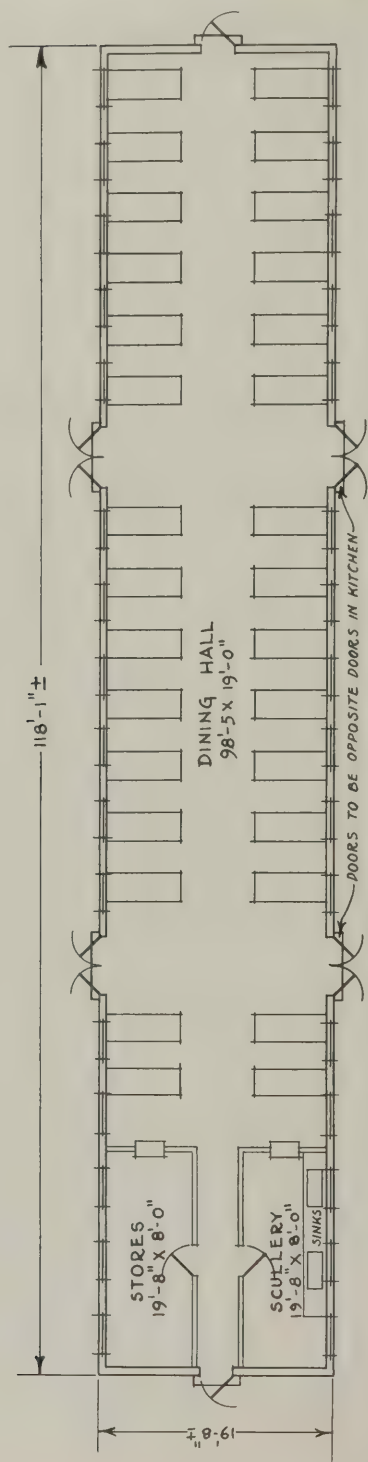


FIG. 43. Patients' dining hall, hospital unit, type A, for use only when demountable buildings were furnished

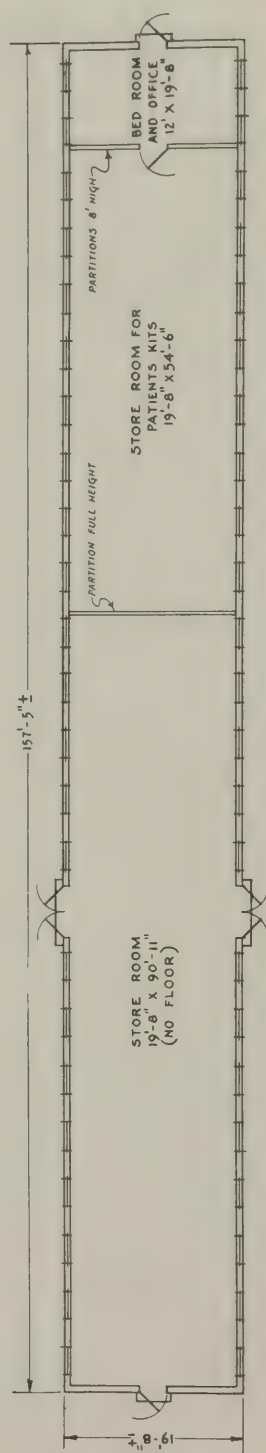


FIG. 44.—Quartermaster's storehouse, hospital unit, type A, for use only when demountable buildings were furnished

dominant consideration causing its adoption was the need to compensate as far as possible for the shortage in personnel, by reducing staff and overhead demands to a minimum. It was planned as early as September, 1917, to group from 2 to 20 hospitals and a convalescent camp at each of these formations and that the largest of them should have from 30,000 to 36,000 beds.²

The geometrical layout of the individual unit admirably fitted in with any grouping scheme. When a site capable of accommodating a number of the type A units was selected, an initial survey, with particular reference to contours, was made by the Engineer Corps, A. E. F., and the grouping eventually adopted with reference to the most adaptable conformation to these contour lines.² By doing this and by bearing in mind that the majority of the buildings were but 20 feet wide, a considerable saving in piling matériel or excavation work was effected. The location of the units, moreover, was made with a view of harmonizing the administration of the center.

In consultation with those in charge of construction, representatives of the chief surgeon's office worked out and adopted an appropriate layout for each center.² The primary requisite was the decision as to the location and adequacy of railroad sidings, all of which had to be newly installed, and the frontage of units on these sidings. The requirements for the administration and supply of these centers were made by providing suitable extra buildings for that purpose. Central water, sewerage and lighting systems, garages, storehouses, etc., also had to be installed. In fact, the larger centers, in some of which we had projected a capacity of 20,000 beds, approximated the creation of a veritable city with all its accessory requirements.

PLANS FOR CAMP HOSPITALS, TYPE B UNITS

The layouts of the type A and type B units were highly similar, differences between the two consisting chiefly in the size and completeness of the buildings employed.³

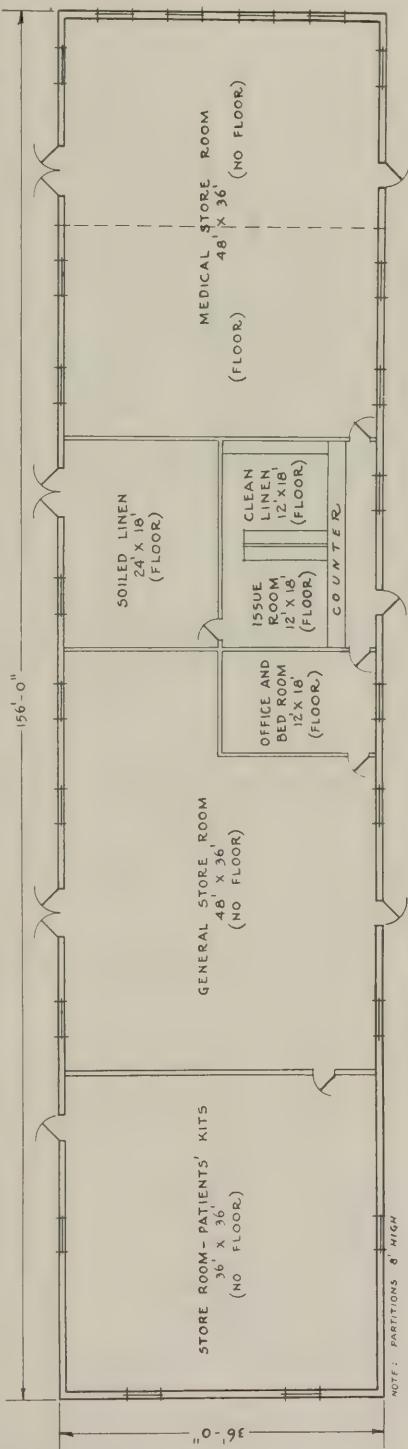


FIG. 45. Quartermaster's and medical storehouse, hospital unit, type A. Permanent type

Type B hospitals were much less elaborate than those of type A, for it was intended that they would provide only the barest hospital necessities.² Though each of these was a fairly complete working plant with operating room, X-ray laboratory, etc., they were not designed to give definitive treatment. Each type B unit required an area 600 feet square and consisted of a central block of service buildings and two lateral rows of five wards each.² Each of the wards was 100 feet long by 20 feet broad and accommodated 30 patients. In each of these units also, space was reserved, in prolongation of the wards, for crisis expansion by tentage, or where permanent expansion was desired, by huts.² The normal capacity of the units was 300 beds but with the crisis expansion a total capacity of 1,000 beds was provided.

Type B hospitals were never grouped, but were scattered throughout France, to meet needs arising in isolated commands and in training areas.²

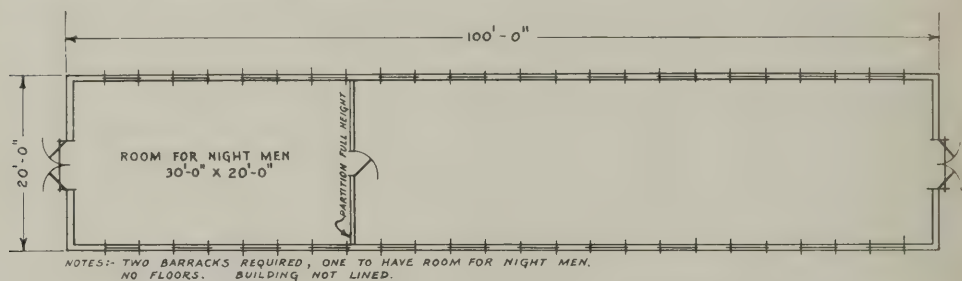


FIG. 46.—Barrack building, hospital unit, type A. Demountable

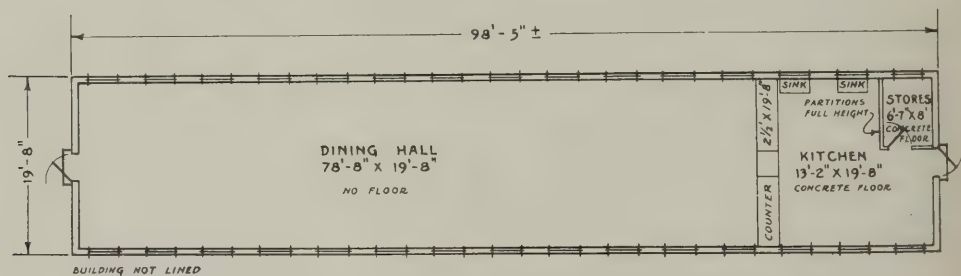


FIG. 47.—Personnel dining hall, hospital unit, type A. Demountable

They were a very important element of American Expeditionary Forces hospitalization and proved to be quite indispensable. On the day the armistice was signed 66 of these units were in operation.²

QUALITY OF CONSTRUCTION WORK

The quality of the construction work performed in our various individual hospitals and hospital centers varied from good to bad, seemingly conforming to the individual experience and efforts of the officer locally in charge of construction.² Many of the projects were turned over to French or English contractors who secured the best results. The work performed on some of the hospital projects, particularly those in the advance section, was highly unsatisfactory, being of a makeshift character with apparently no attention to detail or desire to make the best of the material at hand.² It was early pointed out and particularly emphasized by the chief surgeon's office that the first requisite

in any construction program was the building of good roads, and the development of the water and sewer systems. In many of the projects these desiderata were overlooked, construction of buildings being started before any work had been done upon roads. Hospital sites, when this procedure was followed, soon became small seas of mud, and progress was materially handicapped. As late as December, 1918, many of the essential roadways in these units were in inexcusably bad condition.²

In those parts of France where our base hospitals were erected, cloudy days prevailed for the major part of the year and for this reason north-south orientation with east-west exposure to sunlight was not as important a factor as it would have been in more sunny localities, nevertheless, wherever practicable, this orientation was practiced.

To avoid excessive piercing, all buildings were arranged on parallel lines with the general layout conforming as far as possible to contour lines.

Recognizing the shortage in material, and the great difficulty of obtaining in adequate quantities many of the essential articles required in a great construction project of this nature, every conceivable refinement was eliminated from these type A and type B hospital units.² For example, porches were not included. Because of the prevalence of inclement weather in France, particularly in the territory in which we were required to hospitalize, it was believed that overhead protection in the form of covered passageways along the front of the ward entrance and connecting up the central group of clinical and mess buildings should be provided. These were prescribed in the plans as finally adopted, but were never installed in any of the units, owing to scarcity of lumber. Because of the fact that plumbing material could be procured in very limited amounts only, plumbing fixtures were reduced to a minimum. Buildings were heated by stoves; fecal matter was disposed of by the pail method and incineration.

CONVALESCENT CAMPS

With the speeding up of troop movements early in the summer of 1918, it was soon realized that fixed hospitalization, as its acquisition was then progressing, could not keep pace with the arrival of troops. To meet this situation it was decided to provide convalescent camps in the vicinity of and as part of large

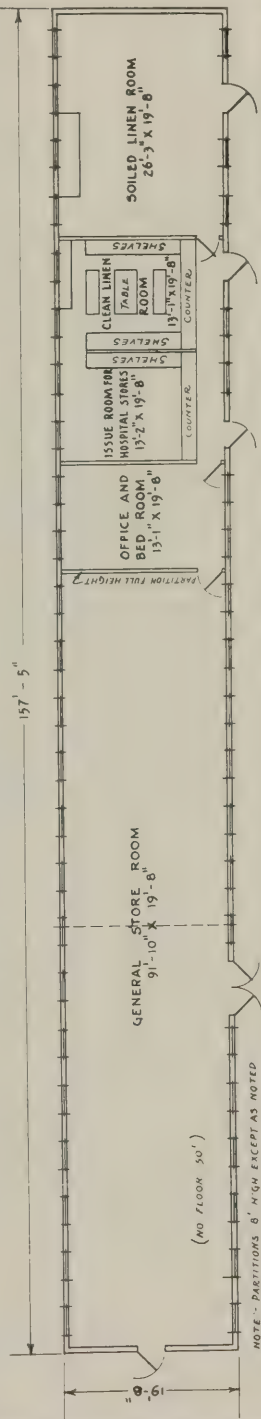


FIG. 48.—Medical storehouse, hospital unit, type A. This building was to be used only when demountable barracks were used. The permanent type is shown in Figure 45

hospital centers to which men not yet fit for duty, but who no longer required careful hospital treatment, could be sent pending their fitness for return to duty.⁹ In these camps the men were provided with shelter. The bed space was limited but the food was good, and the men were given a certain amount of work and exercise to fit them for their forthcoming duty. The assistant chief of staff, G 4, general headquarters, on June 1, 1918, authorized the construction or establishment by tentage of these convalescent camps, on the ratio of 20 per cent of our total bed capacity.¹⁰ Many of these camps were in operation upon the conclusion of hostilities on November 11, 1918, and it was through their operation

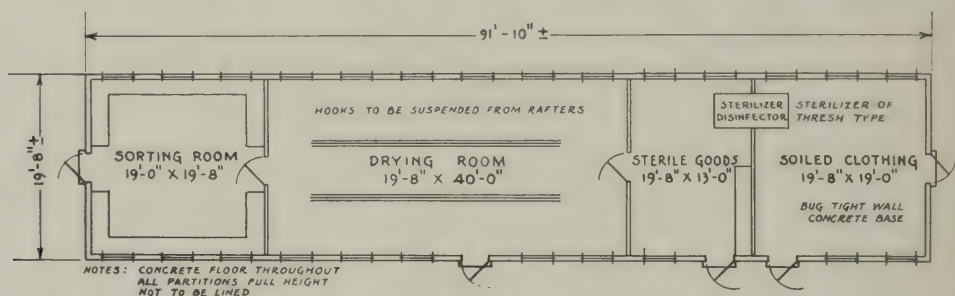


FIG. 49.—Disinfectant building, hospital unit, type A, for use only when demountable barracks were used

only that we were able to provide accommodations for the battle casualties occurring during the summer and fall of 1918.²

TENTAGE

The intended use of tents in connection with fixed hospitals in the American Expeditionary Forces was to permit a rapid expansion of the bed capacity of a hospital during stress³ and to shelter patients in convalescent camps.⁹ As stated above, in the plans of both type A and type B hospitals the permanent

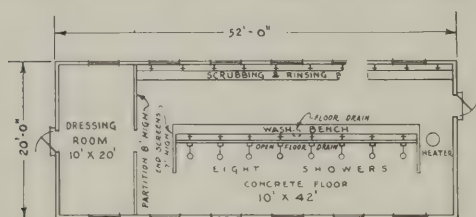


FIG. 50.—Ablution building, hospital unit, type A. Demountable

wards were so situated as to leave space at their outer ends for ward tents. Thus patients in the permanent wards so far improved as to be no longer in need of close supervision by ward surgeons and nurses could with safety be removed to the contiguous tent wards, leaving space for the more seriously sick or wounded.

The kinds of tents used were two European models, the marquee and the Bessonneau and our own Medical Department ward tent.¹¹ Contracts were made with three companies in France for 10,000 Bessonneau tents.¹¹ This is a double-wall tent, capacity 26 beds normal, 30 beds emergency. It is well lighted with windows, and since stoves may easily be installed, this tent is quite warm. If supplied with electricity, suitable walks and roads, this tent makes an admirable ward as it is warmer than the barrack ward. The Bessonneau tents did not begin to arrive until about the 1st of October, and there were only 800 of them in use on November 11.¹¹ Three thousand marquee tents had been delivered by the British, and deliveries were coming in at the rate of 50 per day at the time of the signing of the armistice.¹¹

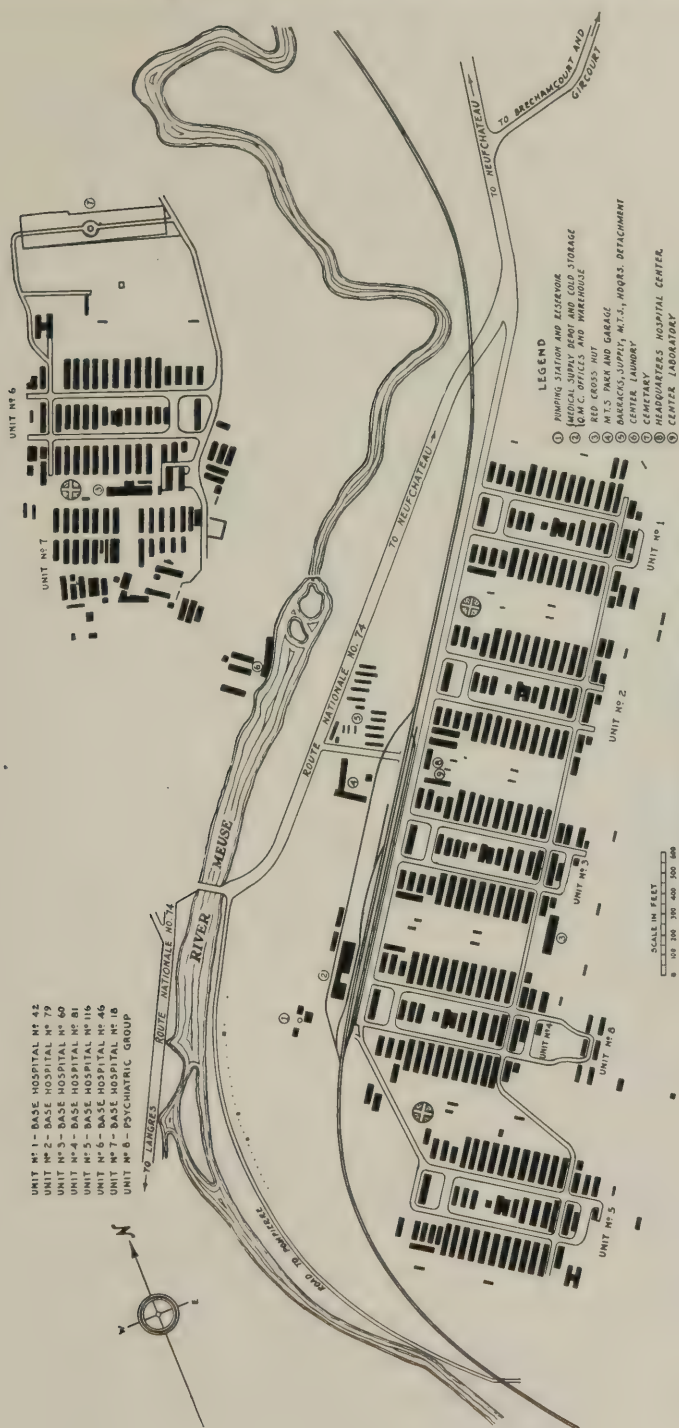


FIG. 51.—General layout, hospital center, Bazoilles

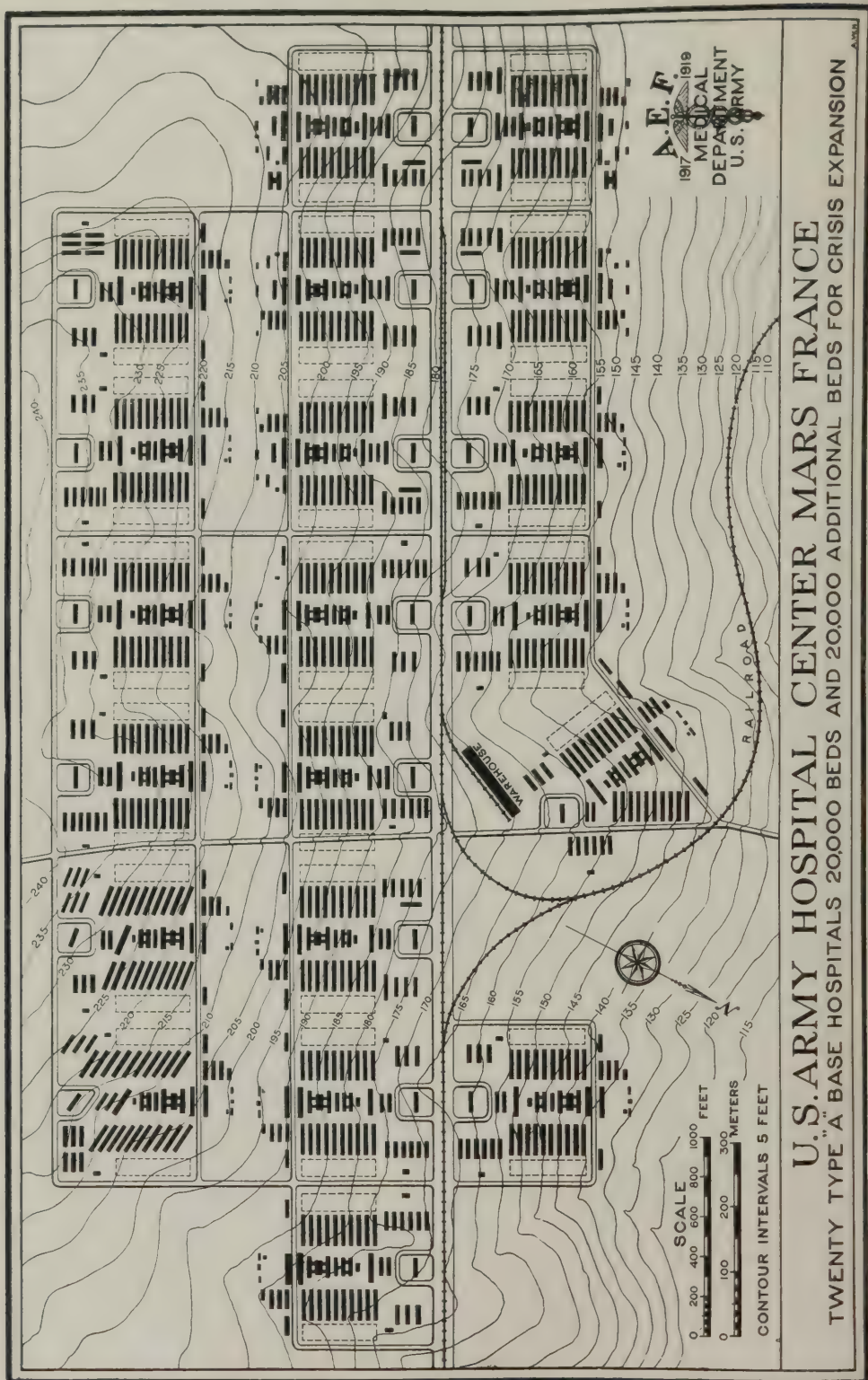


FIG. 52

Because of the inability to obtain an adequate number of either the marquee or Bessonneau tents, practically all hospitals with crisis expansion made use of all three of the kinds of tents referred to. However, the greatest use was made of the United States Army ward tent in connection with the convalescent camps, since the patients therein had convalesced to a point where they needed little or no strict hospital treatment.¹¹

It was necessary to employ approximately 2,500 American ward tents in convalescent camps in the fall of 1918, and when the armistice was signed the chief surgeon's office had placed in use practically all its resources in tentage.¹¹

The question might logically be asked why type A units were not constructed on a 2,000-bed capacity basis from the start, and thus eliminate the necessity for tentage. The reasons for this were obvious. There was not sufficient

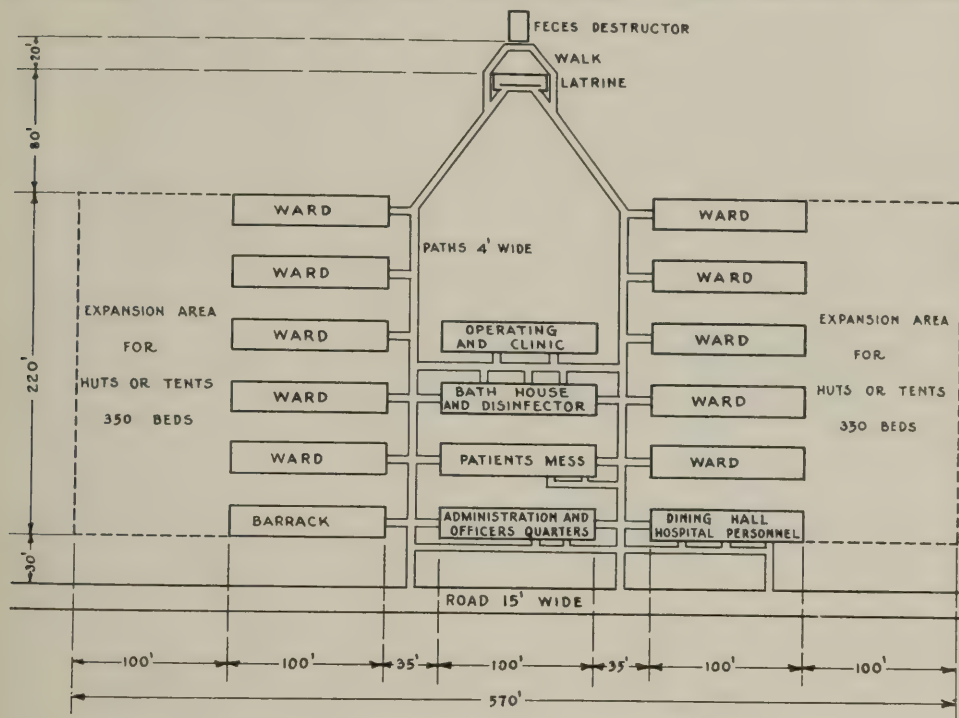


FIG. 53.—General layout, hospital unit, type B (camp hospital)

building material on hand in France to permit of this action; and even had there been, it would have been unnecessary and expensive installation.² In providing for this expansion by the use of tentage we divided our sources of supply and retained a mobility in crisis matériel that was essential in expanding at places requiring it, and, as the name implies, these crises occurred only in certain phases of our combat activities. By expanding only during them, overhead and upkeep expenses were reduced materially.

In this connection, the chief surgeon, A. E. F., expressed the opinion in March, 1919, that a crisis expansion of 1,000 beds made a hospital too unwieldy, and that it should be no greater than 500 beds.⁵

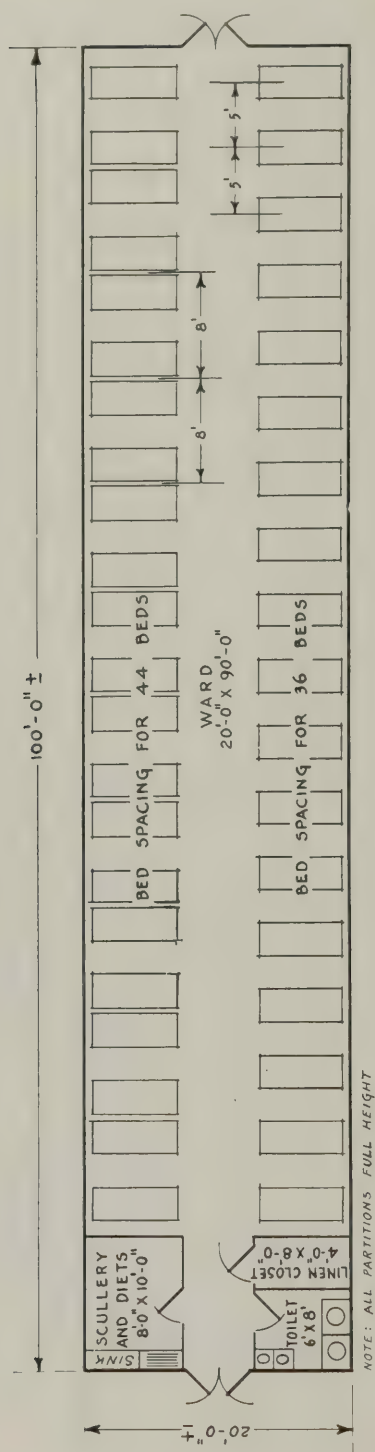


FIG. 54.—Ward, hospital unit, type B

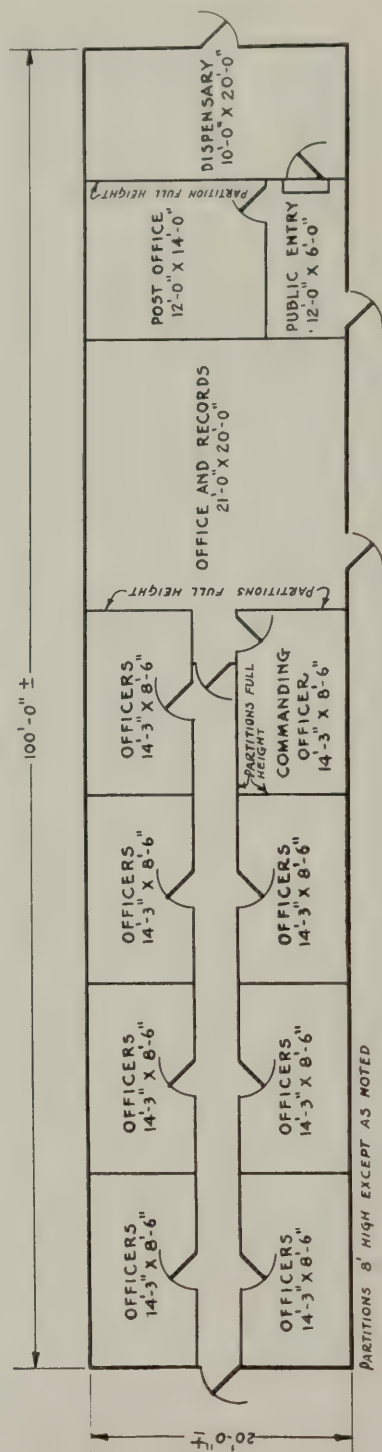


FIG. 55.—Administration building and officers' quarters, hospital unit, type B

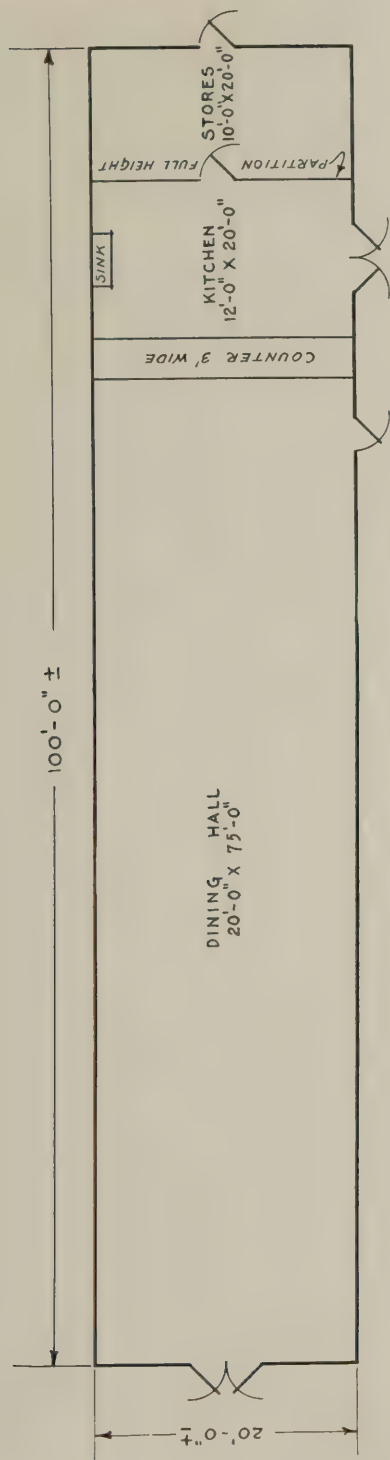


FIG. 56.—Patients' mess, hospital unit, type B

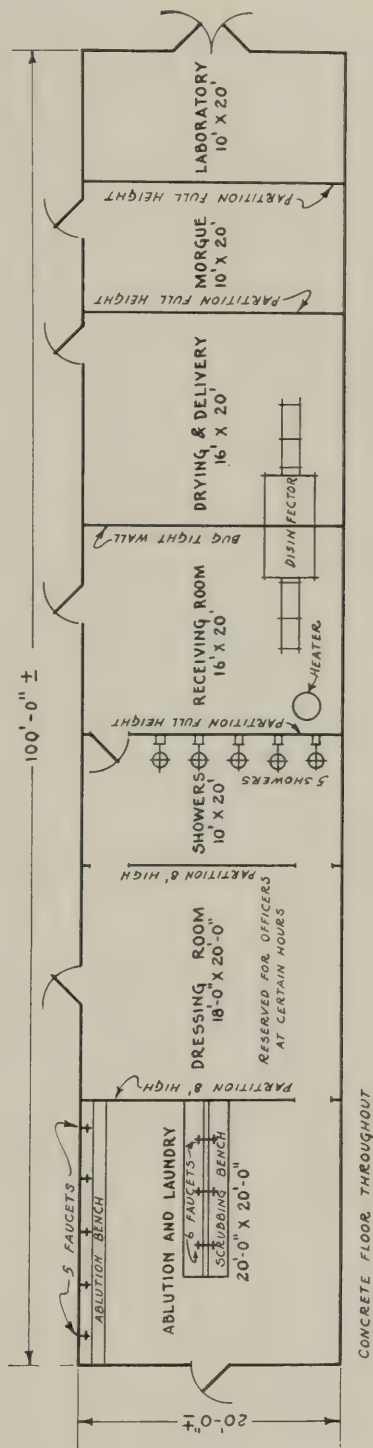


FIG. 57. Bath and disinfectant, hospital unit, type B

PROCUREMENT

Prior to the approval, on August 13, 1917, of a program authorizing

73,000 beds,¹² the chief surgeons' office, A. E. F., had steadily been acquiring existing hospitals from the French, for it was impossible to construct buildings in time to meet the immediate needs of our troops who had begun to arrive in June, 1917.² But when the program authorized June 1 became effective a progressive system of hospital procurement was adopted.² As it was evident that any attempt to administer our base hospitals under canvas would prove impracticable, it was essential that the chief surgeon find buildings in which base hospital units could operate, and during many months he took over the most suitable available structures that could be found. These accommodations could be provided by (1) taking over military hospitals from the French Army; (2) leasing the most suitable buildings available. Buildings in the first category were transferred by the French to the limit of their capacity. No reasonable request was ever refused, and among the hospitals thus transferred were some of the very best in France, but evidently it was neither expedient nor possible that that country deplete its own resources of this character unduly in order to meet our needs.² From our own point of view, too, there were definite objections to taking over French military hospitals, despite the willingness of France to help us to the utmost. One objection was the fact that most of these hospitals were small institutions of from 25 to 300 beds, and that the limited personnel authorized for our service could be used much more economically in operating much larger units.¹³ Moreover, these hospitals, widely scattered, were served largely by French residents of the communities where they were located. When we took over such a formation it was necessary either to lease neighboring quarters for our personnel or to diminish its bed capacity by quartering them in a part of the hospital itself. As explained more fully in Chapter XVI, the bed capacity of our base hospital

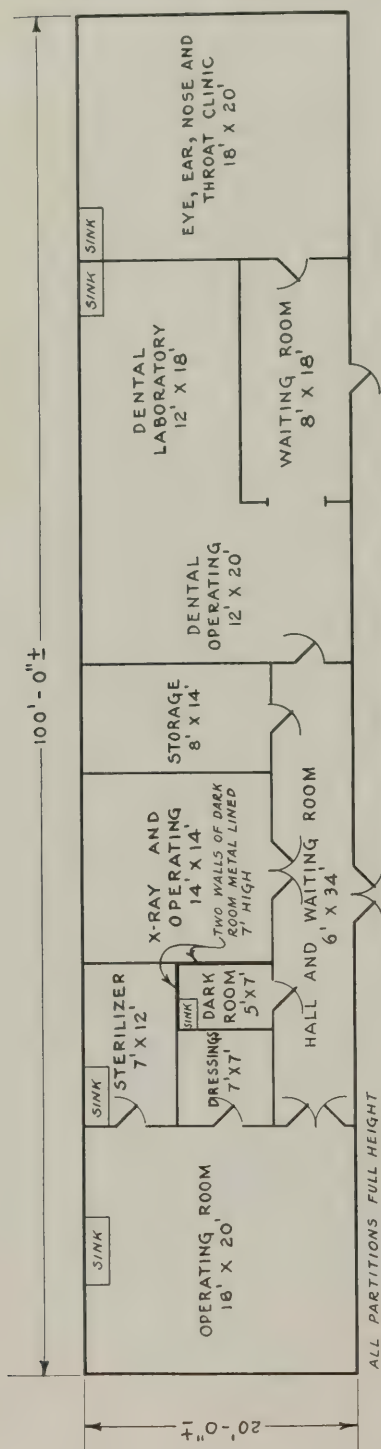


FIG. 38.—Operating and clinic building, hospital unit, typ. B

in order to compensate to a degree for the low percentage of Medical Department personnel authorized on the priority schedule by the general staff, had been increased to 1,000 and made capable of expansion in emergencies to double that size.¹⁴ It was recognized from the outset that only under unusual circumstances could French hospitals be used to advantage, except

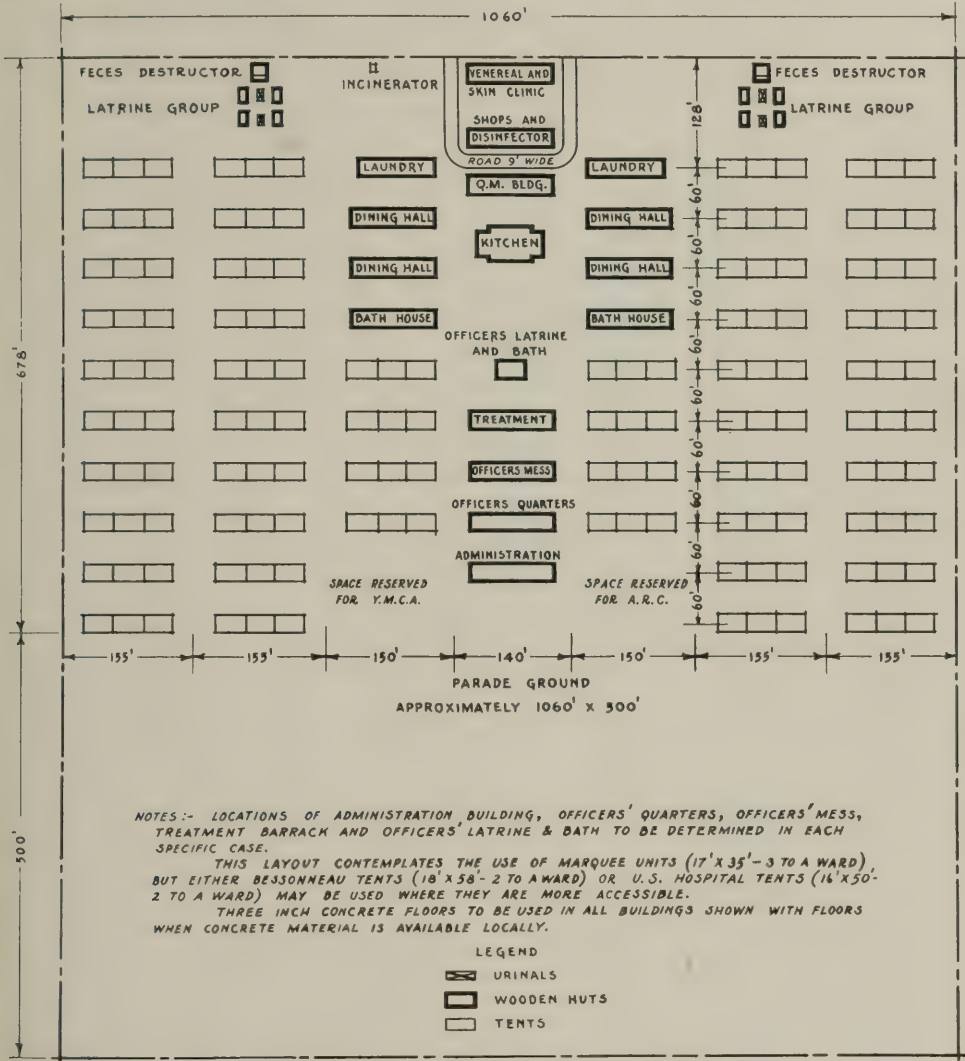


FIG. 59.—General layout, hospital unit, type C (convalescent camp), 2,000 beds

to meet transient needs or to form a nucleus around which barrack extensions could be constructed. Practically all of those which were transferred to our service were much increased shortly after they came under our control.¹³

Therefore, in attempting to meet hospitalization requirements, medical officers charged with the procurement of buildings quickly turned to the adap-

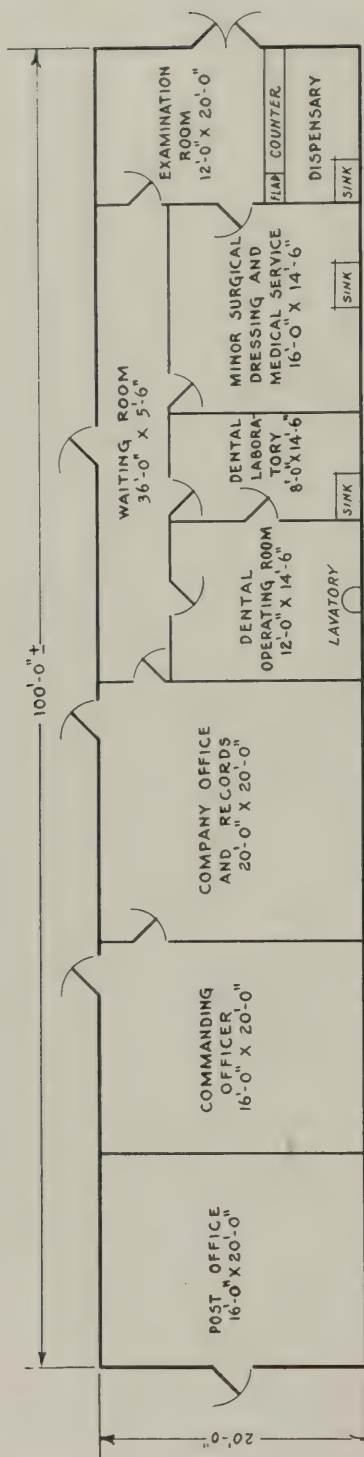


FIG. 60.—Administration and clinic building, hospital unit, type C

tation of suitable buildings. These, however, were comparatively few, most of them having been preempted by the French or by her allies, Belgium, Italy, and Portugal, and were being utilized either for hospital purposes or as habitations for French and Belgian refugees.¹³ Many were occupied by Red Cross and other volunteer aid societies from all parts of the world. Under these circumstances, when the United States entered the field it was found that the majority of possible hospitals discovered or offered were lacking essential and rudimentary hospital facilities or potentialities.¹³ Common defects were inaccessibility, poor state of repair, lack of sanitary plumbing, small size and wide dispersion of buildings. Nevertheless, anticipating the arrival of large bodies of troops from the United States necessitated the procurement of existing buildings. This was pushed to the utmost, though most buildings taken over required alterations, additions, and repairs in order to make them suitable for hospital use.¹³ On September 27, 1917, the chief surgeon, A. E. F., reported in some detail the difficulties which would be encountered in adapting existing buildings to hospital needs. On the 17th of the following month he wrote the Chief of Staff as follows:¹⁵

It is recognized that in the present emergency anything that offers shelter for patients must be used. However, the use of such buildings as the French have offered can be considered only as an emergency measure and in no wise meets, from our point of view, the demands for adequate hospital facilities.

Among the buildings taken over were school buildings, hotels, chateaux, barracks, factories, and even stables. School buildings, as a rule, were among the earliest buildings utilized.¹³ Almost invariably they were unsatisfactory; few had running water, sewer connections, or toilet facilities. Under the French law, when schools were requisitioned for military purposes the teaching personnel, which were furnished living quarters in the building, had to be allowed to

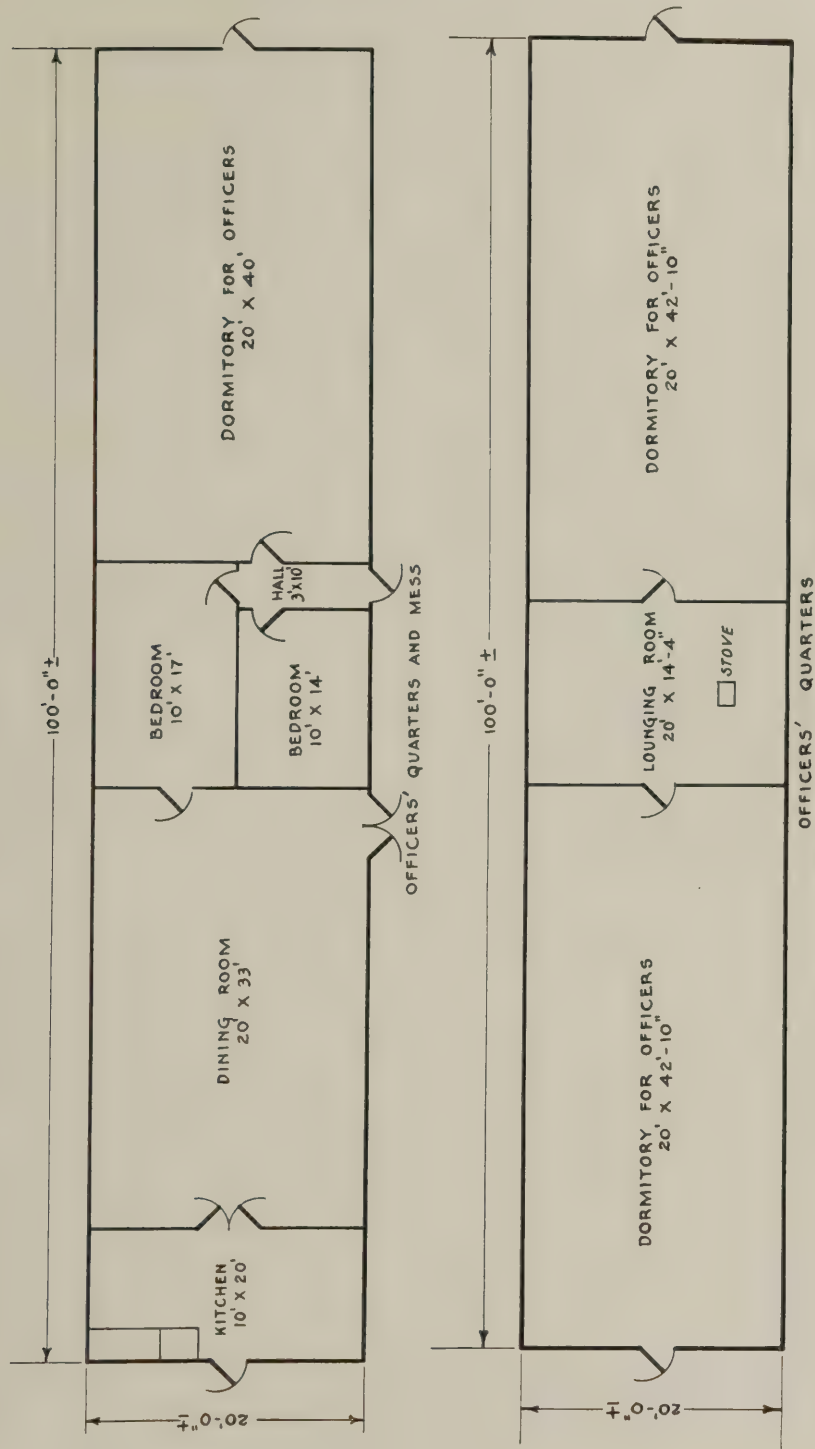


Fig. 61.—Officers' quarters and mess hall, hospital unit, type C

retain them.² The result was that in the same buildings there would be wards

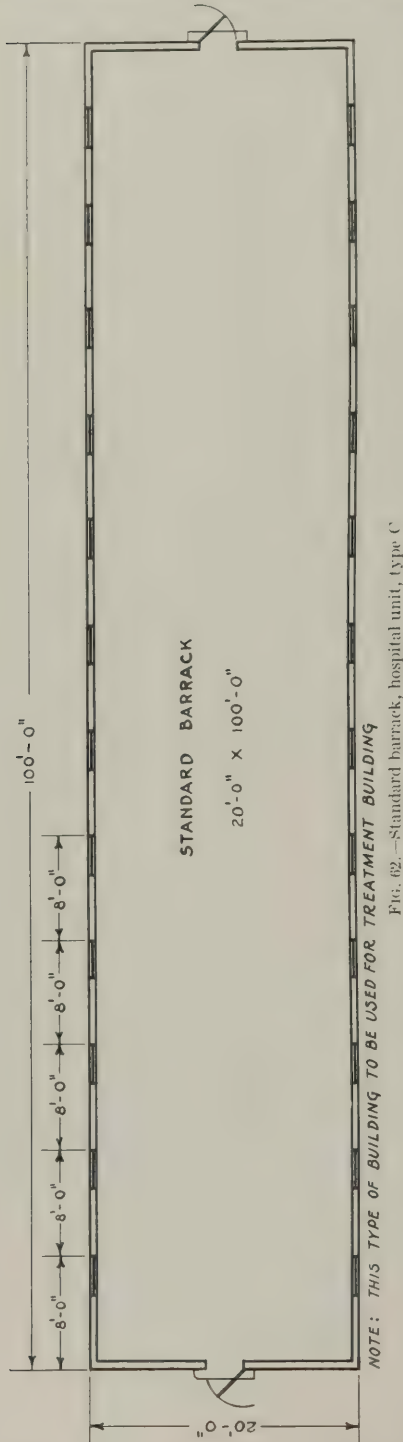
for patients, quarters for personnel, and living quarters for French civilians—arrangements that were inevitably unsatisfactory to all concerned.

Objections to the use of hotels as hospitals rested on other grounds.¹³ As practically all the best and most suitably located buildings of this class had been taken over by the allied governments, those available were very largely summer hotels without heating facilities. Usually, they had insufficient water and very limited plumbing, and they required many alterations before they were suitable for hospital purposes. Also the rate of rentals was very high. In addition, when a private building was taken over for military purposes the owner was allowed by law to reserve certain parts of the building; also the law required that a building should be returned to the owner in the same condition as when taken out of his control.² The latter provision necessitated refurnishing these structures at high cost and removing all improvements or additions which might have been installed. Furthermore, they were difficult to administer and extravagant in their requirement of personnel.

With many differences in detail, the difficulties incident to the use of other buildings were comparable to those pertaining to hotels. Barracks, because of their large ward space, were more easily administered, generally speaking, than the hospital established in other preexisting structures.¹³

When we desired an existing French hospital, or buildings being utilized by the French as a hospital, a representative of the chief surgeon inspected it and if it was deemed suitable, a request by letter was made upon the French for its transfer to the American Expeditionary Forces, through the chief of the mission attached to headquarters of the American Expeditionary Forces.² The date of transfer was decided upon and the French thereupon notified us when we could

take control. As a rule, the Medical Department of the American Expeditionary



Forces usually took over in these buildings all the hospital property that was still serviceable.²

Careful inventories, which included the conditions of buildings and lists of the property contained therein, were prepared by representatives of the American and French Armies, acting jointly.² These inventories were prepared in quadruplicate and each interested party was furnished a copy. Record of these transactions was maintained in the chief surgeon's office, A. E. F. From this beginning gradually developed the service later known as "rents, requisitions, and claims," which later took charge of all such transactions and became the custodian of these records.² The personnel of the chief surgeon's office which had been gathered together for this purpose was transferred to that service when it was officially put into operation.

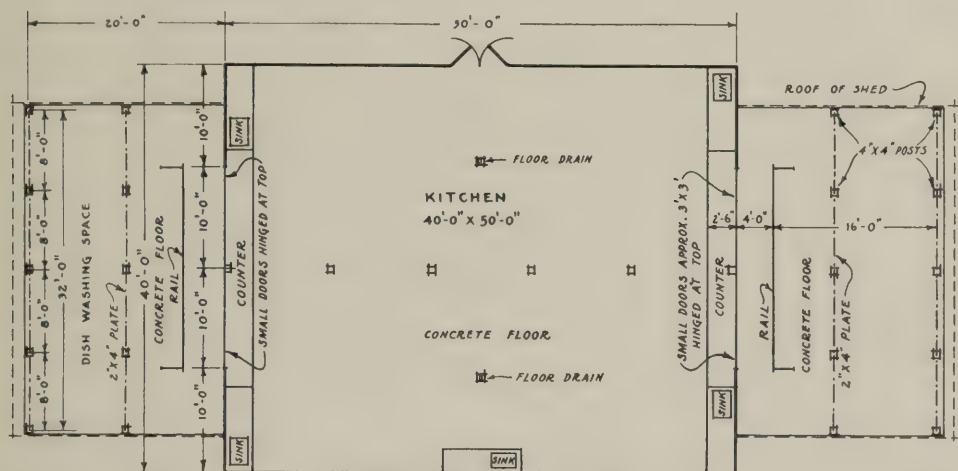


FIG. 63.—Kitchen, hospital unit, type C

The acquisition of schools, hotels, and other buildings not previously occupied as hospitals was accomplished through leases obtained generally through a local representative of the French Army.² Rarely was it necessary to resort to military requisition, although in a few isolated cases this proved necessary.²

Securing private buildings was not unattended with great difficulty; on the contrary, much opposition was encountered even after they became available to us. Endless bickerings with proprietors and directors led to almost endless correspondence which could result only in the greatest amount of delay in making the buildings over into hospitals.¹⁶

In July, 1918, when our hospitals in France provided beds for but 5.7 per cent of our troops there, the French were asked for buildings sufficient for 45,000 beds, because of the difficulties in the way of construction.¹⁶ The beds requested were to be in buildings located either on our line of communications or, if not there obtainable, then in the more remote parts of France. The central bureau, Franco-American relations, which controlled all such requests, unofficially

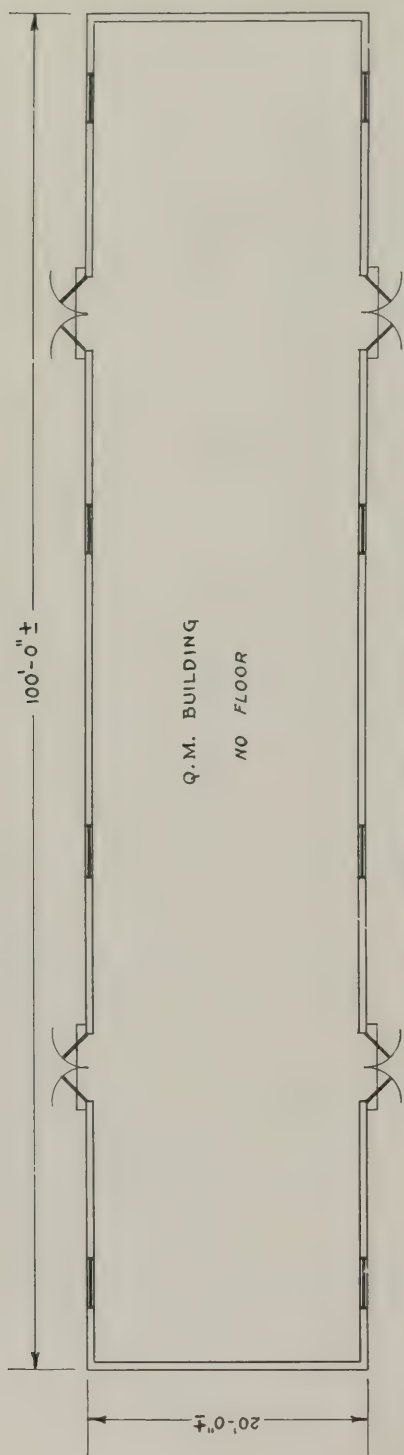


FIG. 64.—Quartermaster building, hospital unit, type C

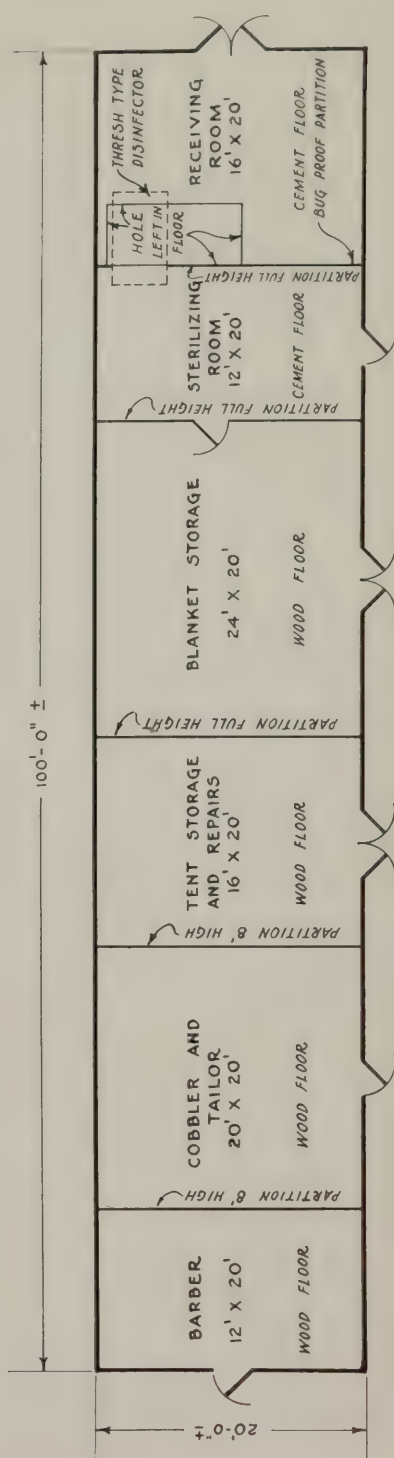


FIG. 65.—Shops and disinfecter building, hospital unit, type C

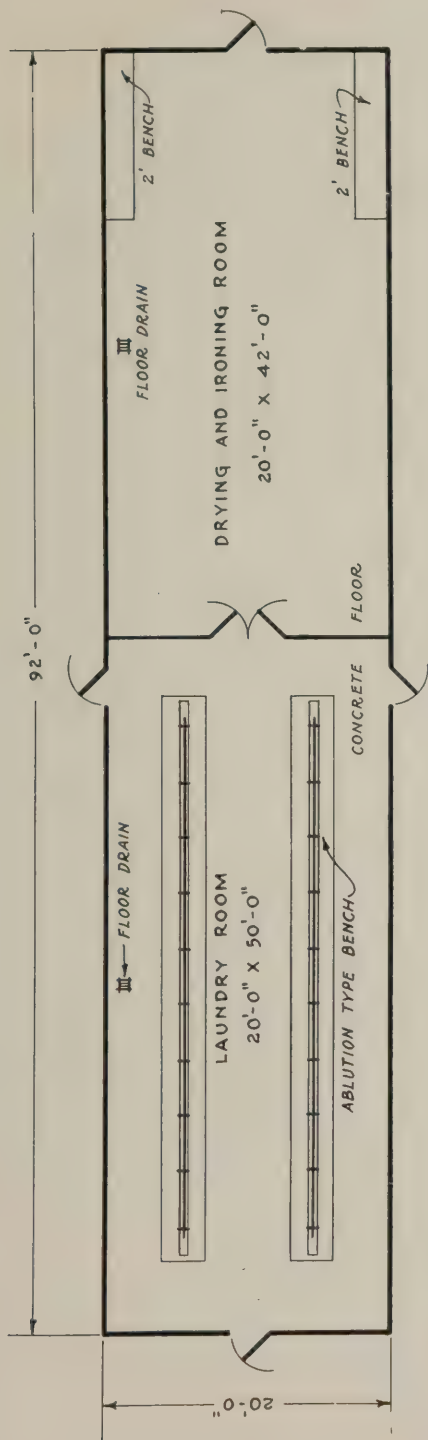


FIG. 66.—Laundry building, hospital unit, type C

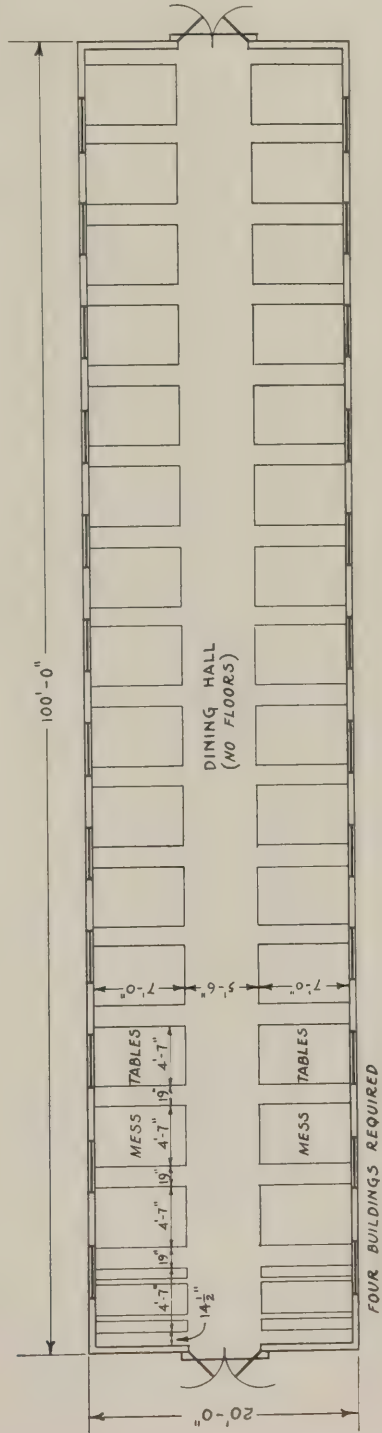


FIG. 67.—Dining hall, hospital unit, type C

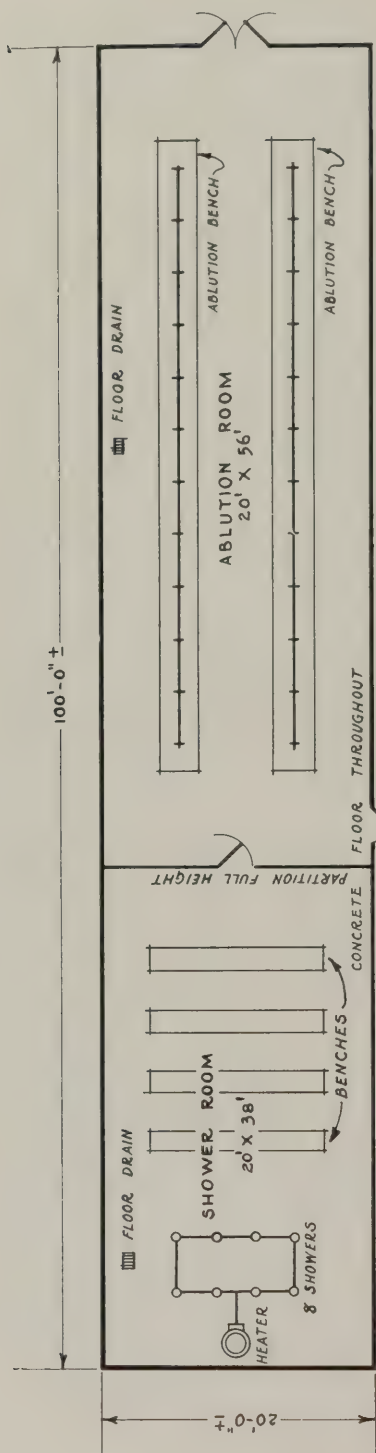


FIG. 68.—Bathhouse, hospital unit, Type C

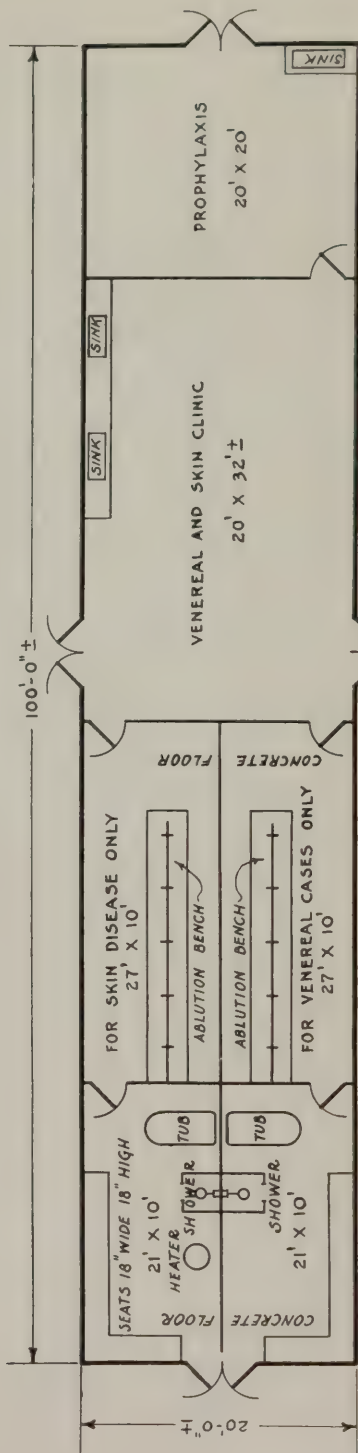


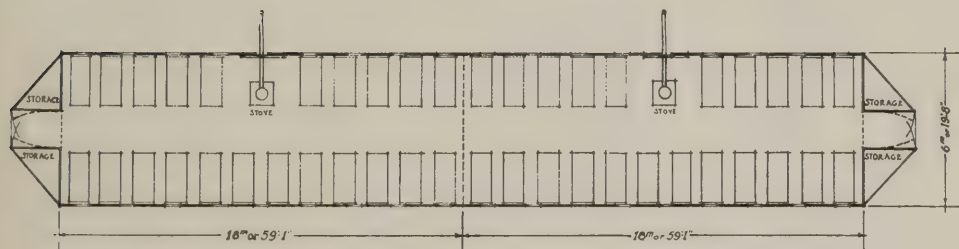
FIG. 69.—Venereal and skin clinic, hospital unit, Type C



FIG. 70.—Perspective of a Bessonneau tent in a two-tent unit



FIG. 71.—Perspective of a Bessonneau tent, showing framing and double walls



PLAN OF A TWO TENT WARD
44 BEDS

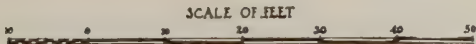


FIG. 72.—Plan of a two-tent (Bessonneau) ward

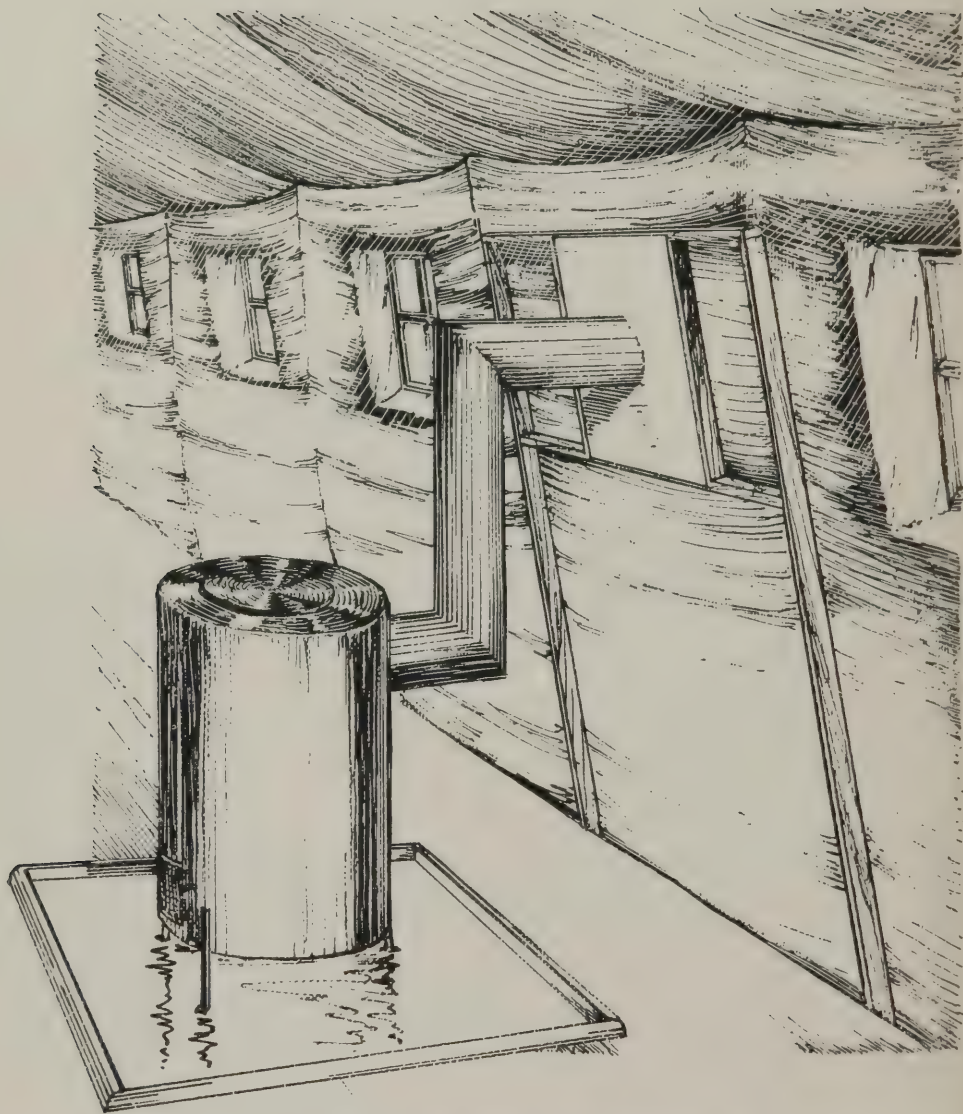


FIG. 73.—Showing heating arrangements in a Bessonneau tent

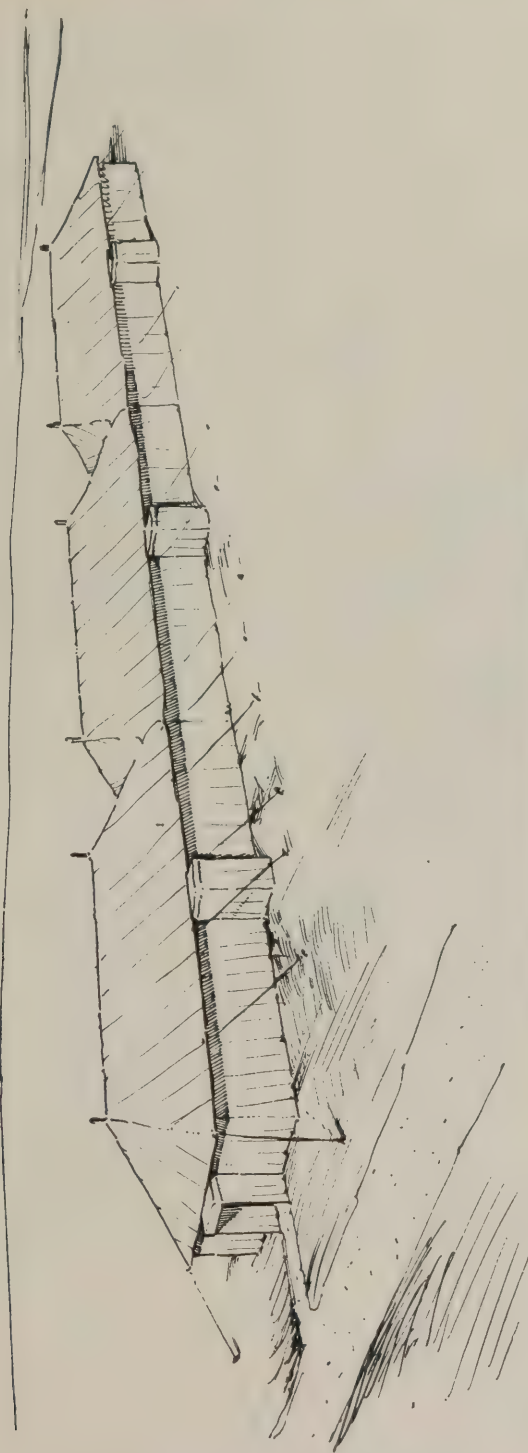
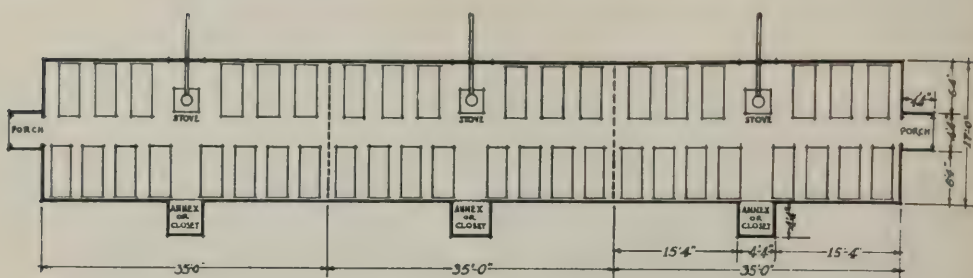


FIG. 74.—Perspective of a marquee tent, showing a unit of three tents



PLAN OF WARD OF THREE TENTS

42 BEDS

SCALE OF FEET

FIG. 75. —Plan of a marquee tent ward of three tents

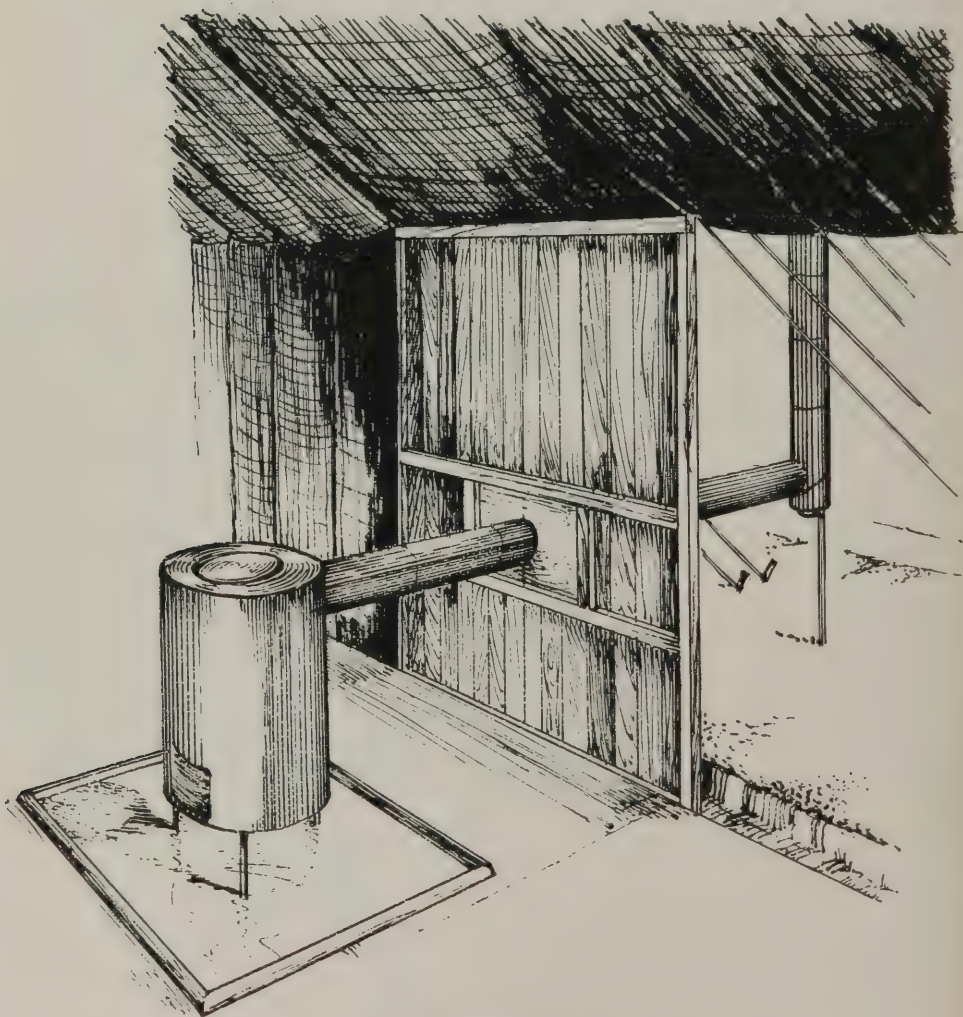


FIG. 76. —Showing heating arrangements in a marquee tent ward

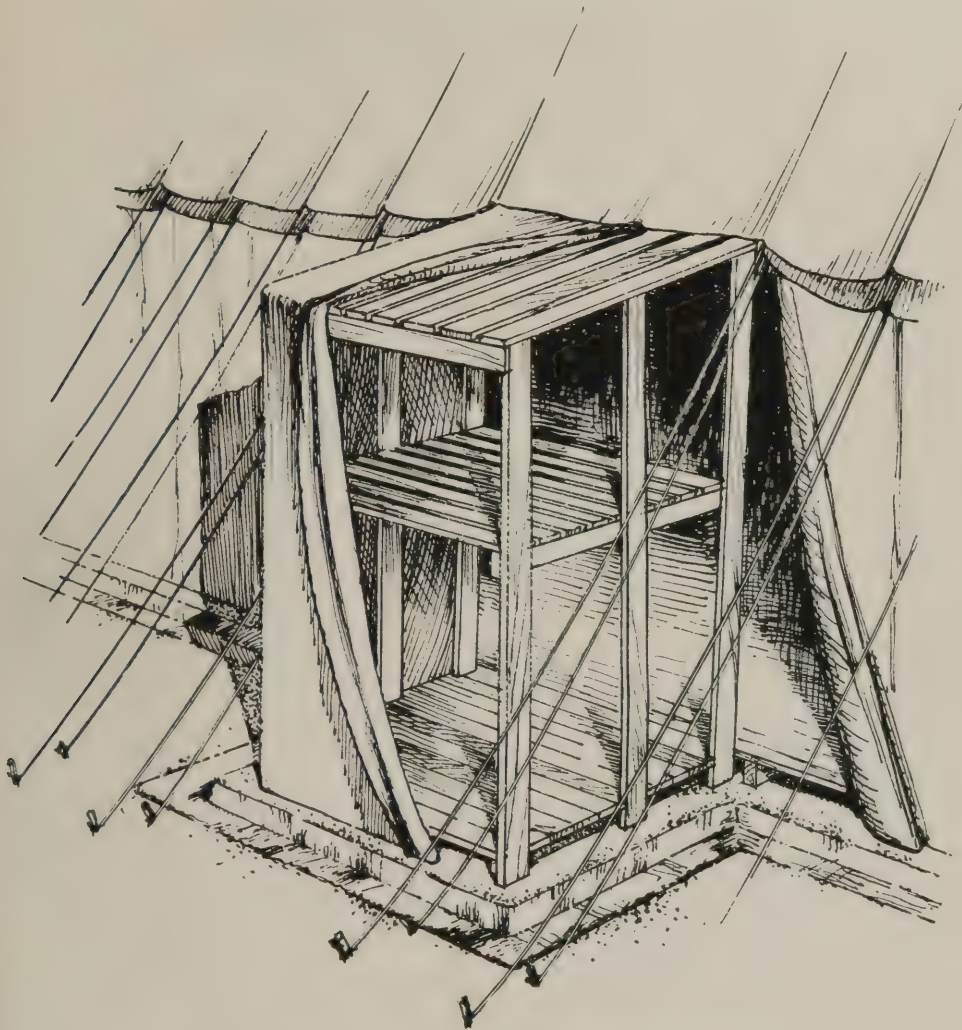


FIG. 77.—Perspective of closet in a marquee tent ward, showing construction

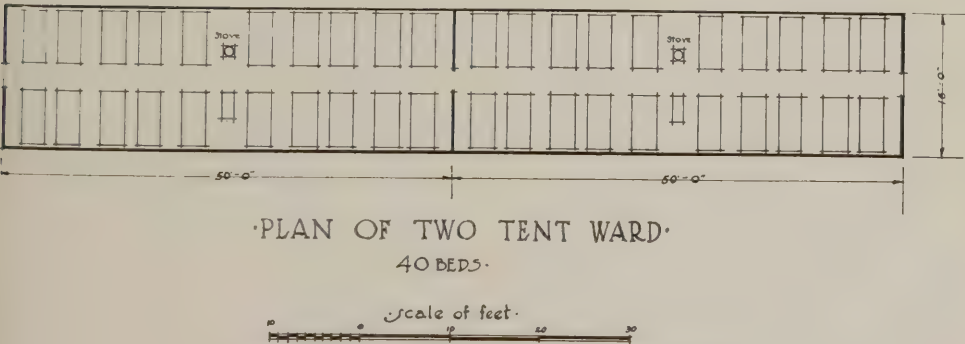


FIG. 78.—Plan of a two-tent ward, United States hospital ward tent

answered all the requests made by furnishing lists of buildings that were quite different from those desired, thus necessitating our rejecting many buildings as being unpractical for our purposes.¹⁷ Because of the urgency of the situation, General Pershing addressed the Premier of France as follows:

GENERAL HEADQUARTERS,
AMERICAN EXPEDITIONARY FORCES,
France, August 16, 1918.

Monsieur GEORGES CLEMENCEAU,
President du Conseil, Paris.

MY DEAR MR. PRESIDENT: General Ireland, the chief of our Army Medical Service, has brought to my attention the vital need of extra hospital facilities, which we must have as soon as possible. At present we have at the most but 6 per cent of beds for our troops in France, and it is agreed that 10 per cent is the lowest safe margin. In view of the increased program of troop arrivals, it will be impossible for our hospital construction to keep pace with the influx of troops, so that it is necessary to call on your people for an increasingly large amount of hospital space in buildings already constructed. On July 13 a request was made for 45,000 beds in buildings either on our line of communications or, if this were impossible, in the more remote parts of France, and a specific request has been made for various hotels, schools, and military barracks which have been inspected by our medical officers. A copy of this list is herewith attached, with the addition that we have made a request for and need the École de Legion d'Honneur at St. Denis.

In accordance with instructions No. 9 of February 12, from the office of the Undersecretary of State, these questions have been handled entirely with the central office of the Franco-American relations in Paris. General Ireland informs me, however, that he fears that it will be impossible to get the quick action needed. Experience has shown that any specific request for buildings which have been inspected by our medical officers are usually met by a counterproposition which, after a certain length of time, has been made to the American officers in charge of this work. May I not suggest that the central bureau of Franco-American relations hasten to make inspections of a number of buildings suitable for hospitals with a view of meeting, without delay, the increasing necessity for largely increased accommodations for our sick and wounded? Just now, time is the all-important factor, and anything you may be able to do to enable us to meet our early requirements will be most highly appreciated.

I regret having to bother you with this matter, but in view of its importance I bring it to your attention, knowing well that with your powerful assistance we will achieve the results that we desire in the quickest possible time.

Permit me to express my thanks for the splendid efforts made by your officials to aid us in every way.

With highest personal and official regards, believe me,

Very sincerely yours,

(Signed) JOHN J. PERSHING.

At the instance of the Premier, the French mission now submitted a list of public buildings which, it was stated, had been reserved for the American Medical Service.¹⁸ The French Government wished to divide equally the burden of hospitalization among the territorial departments and among the different classes of buildings in the departments. Long lists of buildings were sent at intervals to the chief surgeon through the French mission, but for various reasons (such as the delapidated condition of some of the buildings, their small size, their remote location) many buildings included in these lists had to be rejected.¹³ Buildings thus offered fell, in the main, into four classes: Military casernes, public or private hotels, schools, and miscellaneous buildings which comprised factories, storehouses, etc. The amount of buildings thus

offered potentially represented beds to the number of 155,422.¹³ Possible accommodations for many more had been taken over by us, but these were found unnecessary after the armistice had been signed.

After the signing of the armistice the buildings which had been accepted from the French on November 11 were returned with the exception of one at Lucon,¹⁹ but procurement of buildings continued for several weeks in order to provide hospital facilities in new locations conformable to the new conditions which arose by the armistice.¹⁵

On November 27, in reply to a request for a conference concerning relinquishment of buildings used for hospital purposes, the commanding general, Services of Supply, wrote the commissioner general for Franco-American war affairs as follows:²⁰

* * * * *

2. Owing to the indefinite information regarding the military situation at present, it is not believed that a conference on this subject should be undertaken at this time, but this can be undertaken as soon as a definite plan of demobilization of the American Expeditionary Forces has been made.

3. Although a reduction of the necessity for hospitalization has been made from 15 per cent to 7½ per cent, since November 11, yet this reduction comes at a time when there are approximately 190,000 patients in hospitals, and we can not operate upon the lesser figure until these cases are returned to duty with their units or evacuated to States.

4. All offers of buildings made on the various lists have been definitely accepted or rejected. Since August 1 these have amounted to approximately 125,000 beds, of which approximately 51,000 have been accepted and approximately 74,000 rejected. Since this time many buildings that have been accepted have been returned through the French mission as being necessary for hospitalization, and from time to time many others will be returned when it is definitely ascertained that they will not be needed and that no troops will be located in the localities concerned.

5. Your attention is called to the fact that every consideration has been given to disturbing schools as little as possible, that wherever possible schools have been evacuated and returned, and this plan will be continued. Attention is also called to the fact that it will be only necessary to requisition buildings in those localities where troops may hereafter be stationed and where no buildings exist. This number will be reduced to a minimum.

6. Regarding the matter of deoccupation of the older establishments obtained during the early part of the American occupation, attention is called to the fact that considerable construction in barracks, or water supply, electric lighting, sewers, roads, drainage, etc., has been done, and it is believed that on this account these should be retained until the last to be evacuated.

7. It will not be necessary to requisition buildings not already in process of organization, but it is desired to occupy many hotels on the Mediterranean and in the Pyrenees, in which it is expected to treat convalescents. These properties were obtained through amicable lease in the main. But few requisitions were made, and their retention is in the main agreeable to the owners. In other localities no buildings have been taken or will be taken where hospitals have not been organized and operated.

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- (6) G. O. No. 46, H. A. E. F., October 10, 1917.
- (7) G. O. No. 58, G. H. Q., A. E. F., April 18, 1918.
- (8) Letter from the chief surgeon, A. E. F., to the chief engineer, A. E. F., September 30, 1918. Subject: Plan of type B (300-bed) camp hospital unit. Copy on file, A. G. O., World War Division, chief surgeon's files (329.32914).
- (9) Memorandum for the assistant chief of staff, G-4, G. H. Q., A. E. F., from Col. S. H. Wadhams, G. S., May 24, 1918. Subject: Hospitalization. Copy on file, Historical Division, S. G. O.
- (10) Memorandum for the commanding general, Services of Supply, A. E. F., from the assistant chief of staff, G-4, G. H. Q., A. E. F., June 1, 1918. Copy on file, Historical Division, S. G. O.
- (11) Report on hospitalization and evacuation of sick and wounded, for the military board of Allied supply, April 10, 1919, by Brig. Gen. J. R. Kean, M. D. Copy on file, A. G. O., World War Division, chief surgeon's files (314.7).
- (12) Memorandum for the chief of staff from the chief of operations section, General Staff, G. H. Q., A. E. F., August 11, 1917. Subject: Hospitalization. On file, A. G. O., World War Division (632).
- (13) Report of the activities of the chief surgeon's office, A. E. F., from the arrival of the American Expeditionary Forces in Europe to the armistice, by the chief surgeon, A. E. F., March 20, 1919. On file, Historical Division, S. G. O.
- (14) Memorandum for the chief engineer, A. E. F., from the chief surgeon, A. E. F., September 20, 1917. Copy on file, Historical Division, S. G. O.
- (15) War diary, chief surgeon, A. E. F.
- (16) Letter from the commander in chief, A. E. F., to the chief of French Mission, Tours, July 13, 1918. Subject: Hospitalization. On file, A. G. O., World War Division, chief surgeon's files (322.32911).
- (17) Letter to M. Georges Clemenceau, President du Conseil, Paris, from General Pershing, August 16, 1918. Subject: Hospitalization. On file, A. G. O., World War Division, chief surgeon's files (322.3291).
- (18) Memorandum for the assistant chief of staff, G-4, S. O. S., from the chief surgeon, A. E. F., August, 13, 1918. Subject: Hospital program, A. E. F. On file, A. G. O., World War Division, chief surgeon's files (322.32911).
- (19) Letter from the chief surgeon, A. E. F., to the chief, French Military mission, S. O. S., November 23, 1918. Subject: Hospitalization. Copy on file, A. G. O., World War Division, chief surgeon's files (329.32911).
- (20) Letter from the commanding general, S. O. S., A. E. F., to the commissioner general, Franco-American war affairs, November 27, 1918. Subject: Hospitalization. Copy on file, A. G. O., World War Division, chief surgeon's files (329.32911).

CHAPTER XVI

THE DIVISION OF HOSPITALIZATION (Continued)

HOSPITALIZATION OF SICK AND WOUNDED

Though the hospitalization division of the chief surgeon's office, A. E. F., was charged with the supervision of all hospitals of the American Expeditionary Forces, this volume gives but brief consideration to the mobile hospitals which served armies, corps, or divisions in battle or in training areas. These mobile hospitals are discussed in Volume VIII of this history, which considers field operations of the Medical Department. Though they were a part of the entire hospital provision of the American Expeditionary Forces, their procurement did not form a part of the hospitalization program as that term was technically understood. The hospitalization program referred essentially to the provision of fixed formations—i. e., base and camp hospitals and convalescent camps—and only when qualified by some explanatory phrase was the term "hospital program" made to include the field hospitalization of the American Expeditionary Forces. One reason for this was the fact that most of these field units were authorized by Tables of Organization in certain numbers for each body of troops and were supposed to accompany them automatically except as this provision was modified by priority of the shipping schedule. Certain units—e. g., mobile hospitals and mobile surgical units—were not originally prescribed by organization tables but were authorized by general orders and were provided according to tactical needs and resources. Thus, mobile hospitals were authorized¹ but not supplied² in the proportion of one per division. But the prime reason why the field units were not included in the hospitalization program proper was the fact that they were expected to give only very temporary accommodation to casualties. They had to clear as rapidly as possible in order to receive new arrivals from the front and to be prepared to clear and move on very short notice in order to accompany the troops they served. Therefore their bed capacity could not be considered a part of the total that should be available at a given moment. Nor did this program technically include infirmaries established by the American Red Cross along the line of communications, nor the infirmaries with capacities of from 10 to 50 beds which the military forces established and staffed with local personnel for care of the slightly sick and injured belonging to regiments in camps, small groups serving in towns, or other detached commands. These latter infirmaries were established where neither the number nor the severity of the cases required the establishment of a camp hospital and were under the administrative control of the local commander. All of these services though not included in the hospitalization program proper were nevertheless under the general supervision of the hospitalization division of the chief surgeon's office.

Therefore, though the term "hospitalization," as technically understood and as utilized in the following text, was applied to only fixed formations, and among these essentially to base and camp hospitals, including militarized American Red Cross hospitals and naval base hospitals receiving Army casualties, and to convalescent camps, it was used also in another and more general sense, being applied to the entire hospital system of the American Expeditionary Forces from the battle areas to the sea. This general system is here briefly described, before a discussion of hospitalization in its more technical sense is undertaken, in order that there may be given a coherent view of the subject in its entirety, and that the position therein of the fixed hospitalization may be defined.

HOSPITAL FACILITIES AT THE FRONT

The following units, which are discussed at some length in Volume VIII, comprised, during the World War, the sanitary train of divisions, corps, and armies:³ 3 field hospitals, motorized; 1 field hospital, animal-drawn; 3 ambulance companies, motorized; 1 ambulance company, animal-drawn; 8 camp infirmaries; 1 medical supply unit; 1 mobile laboratory (added later). The normal capacity of the field hospital was 216 patients.⁴

When we entered the World War field hospitals were equipped similarly throughout and in accordance with existent tables of organization, but the unlooked for conditions it was necessary for them to meet in France necessitated additions to this equipment.⁵ Thus to one of the four divisional field hospitals additional surgical equipment was issued in order that it might function on a larger scale as a surgical hospital. To one of the other hospitals was added the equipment for the treatment of gassed patients.

Field hospitals were utilized according to current needs, their service and disposition differing considerably in the several divisions under changing circumstances. Often two hospitals were combined and here patients were sorted, distributed if need be to the other field hospitals with the division, or sent to the rear.

Usually one of the divisional field hospitals was used to sort patients and to care for the wounded, one received sick, and another gassed, while the fourth hospital was held in reserve or was used to supplement one of the others.⁶ Sometimes one of these hospitals was used for the nontransportable surgical cases only. When facilities permitted, this last-mentioned unit was reenforced by a mobile surgical unit, extra bedding and equipment and, rarely, by surgical teams. The hospitals carried their own tentage, but when opportunity offered occupied buildings in suitable locations.

As stated above, mobile hospitals were authorized in the proportion of one per division in action¹ but were not provided in that number.² Only 12 were actually utilized.² These units were devised to care for the serious surgical cases and therefore were provided with appropriate equipment and with 120 beds for nontransportable wounded. The equipment to a large degree was surgical, and included X-ray apparatus, sterilizing apparatus, operating room supplies, electric lighting plant and mobile laundry. They cared for the seriously wounded who could not be transported to the rear without grave

danger. They were distributed by the army surgeon to augment the service of field or evacuation hospitals. One was used for a time for the treatment, in the army zone, of cranial cases only.⁶ These units, though small, were complete, required but a few hours for their establishment or packing, were readily transportable.

Mobile surgical units were smaller organizations transportable on three trucks each provided with an operating room, sterilizing, X-ray and electric light equipment. They also were assigned by the army surgeon to supplement the hospitals of division, corps, or army.²

The sanitary train of a corps consisted of four field hospitals, four ambulance companies (all motorized) withdrawn from the replacement divisions.⁷ These units cared for and evacuated patients from the divisional hospitals in front of them to the army units in their rear and cared for the disabled while en route.

The sanitary train prescribed for an army was the same as that of an Infantry division.⁸ It was supplemented by the mobile hospitals and mobile surgical units above mentioned, and by evacuation hospitals which were authorized in the proportion of the two per division.⁹ However, that number of evacuation hospitals was never reached, though equipment for 16 of them was sent overseas early in the war.² Each evacuation hospital originally provided for 432 patients but in the summer of 1918 their capacity was increased to 1,000 beds and the equipment of these units already in France expanded accordingly.² In emergencies their capacity was further increased. These units under control of the army surgeon were located at railheads, where they received from the front all patients that were to be sent to base hospitals on the line of communications. They were supplemented by other army hospitals which cared for gassed patients by three neuropsychiatric hospitals and by certain militarized units furnished by the American Red Cross.²

HOSPITAL FACILITIES IN THE SERVICES OF SUPPLY

The hospital facilities provided in the interior, in France, England and Italy, but by far to the greatest degree in France, were base hospitals (including one pertaining to the Navy), hospital centers, convalescent camps, camp hospitals, American Red Cross military hospitals, American Red Cross hospitals, and American Red Cross convalescent homes.²

BASE HOSPITALS

Prior to the World War, base hospitals were the Medical Department units of the line of communications designed to receive patients from field and evacuation hospitals, as well as cases originating on the line of communications, and to give them definitive treatment.¹⁰ It was intended that base hospitals would be well equipped for such treatment and that there would be sent to the home territory only patients requiring special treatment or whose condition might be such as to warrant the opinion that they were either disabled permanently or not likely to recover within a reasonable length of time.

Base hospitals had been organized originally with a staff of 20 officers, 46 nurses, and 153 enlisted men.¹⁰ This staff was increased in the latter part

of 1917, then consisting of 35 officers, 100 nurses, 200 enlisted men and a valuable but limited number of civilian employees, viz, dietitians, technicians, and stenographers.¹¹

Base hospital units were allowed in the shipping schedule in the proportion of four to a division, but were displaced to a considerable degree by combat troops, with the result that from the time our forces began to conduct operations on a large scale, in the summer of 1918, their number was inadequate and remained so until after the armistice was signed.² In many instances their equipment was not received for many months after having arriving overseas.

HOSPITAL CENTERS

In the American Expeditionary Forces the controlling factor in the preparation of plans for base hospitals was economy in personnel and material. But there was every necessity for further economy in personnel, administration, and supply; consequently, these hospitals were grouped, in so far as local conditions permitted, into "centers of hospitalization,"¹² or hospital centers, as they came to be called.

CONVALESCENT CAMPS

Before headquarters, A. E. F., authorized the establishment of convalescent camps, on June 1, 1918,¹³ there were in nearly all our military hospitals in France many patients whose medical or surgical treatment had been completed, but whose physical condition was such that their attending surgeons could not return them to their commands for full duty.¹⁴ Since there was every necessity for keeping as many base hospital beds as possible ready for the reception of patients from the front, the substandard men referred to above frequently had to be evacuated long distances to other hospitals where the demand for beds was not so insistent. Particularly was this necessity for a clearance true of the base hospitals located nearer to the front. To relieve this condition and, at the same time, to increase hospital facilities generally, the chief surgeon, A. E. F., recommended on May 17, 1918,¹⁵ that convalescent camps be authorized and constructed, one in the vicinity of each hospital group. Its size in point of bed capacity was to be rated at one-fifth that of the hospital group it was to serve.

The cases to be sent to a convalescent camp were those for whom medical and surgical treatment, beyond dispensary care was no longer necessary, but who needed a more or less brief period of graded physical training and rehabilitation suited to their condition. This physical rehabilitation was to be under an experienced medical officer; but line officers assisted by noncommissioned officers, temporarily or permanently disabled for further duty, were to be used for commanding and drilling provisional companies. Thus over-hospitalization and loss of discipline would tend to be obviated.

Though it was proposed to use barracks for convalescent camps, no objection was held to the use of tents, the stipulation being, however, that there should be an increase in floor space over that for ordinary barracks and that there should be no double bunks.

As mentioned above, this proposal of the chief surgeon was approved by headquarters, A. E. F., June 1, 1918. The bed capacity of convalescent camps was included in the normal capacity of the hospitals with which they were connected.

CAMP HOSPITALS

It is neither necessary nor advisable to place all cases originating on the lines of communications in base hospitals; all such cases do not require the more extensive or definitive treatment for which base hospitals are intended; furthermore, it is axiomatic that sick and injured soldiers should receive hospital care just as near their commands as is compatible with the condition of the patients and with the exigencies of the military situation. Therefore, in the American Expeditionary Forces for each divisional training area and camp, a camp hospital was provided,¹⁶ where all local cases could be admitted, only the severely sick and injured requiring a better quality of treatment being transferred to base hospitals.

As early as July, 1917, the chief surgeon, A. E. F., attempted to secure authorization for personnel for these important units but his recommendation was disapproved, on the ground that personnel from the divisional sanitary trains would be available to fill this need.² Experience proved that such a view is based on a misconception of the problem presented. To employ the sanitary train personnel in this way prevents the training in preparation for combat, which is just as essential for sanitary units as for those of the line. Moreover, divisions were constantly changing from one area to another and to have followed the plan proposed by the general staff, A. E. F., would have resulted in abandoning these excellently-equipped sanitary formations until the next division chanced into the same area.² The necessity for providing and authorizing sanitary personnel for the camp hospitals is one of the outstanding lessons of the experience gained in this war.²

CAPACITY OF HOSPITALS

BASE HOSPITALS

The pre-war bed capacity of a base hospital was 500.¹⁰ This was based upon the fact that in a war of motion it frequently would become necessary with the progression or recession of the battle front to change the locations of base hospitals along lines of communications. Thus mobility was a factor which had to be borne in mind in connection with the equipment of a base hospital. However, in France, there was every indication that the location of a given base hospital would be relatively fixed; consequently, in his study of hospitalization for the American Expeditionary Forces, the chief surgeon, A. E. F., on August 2, 1917, stated that the personnel of a base hospital, with proper material, could reasonably well care for 1,000 patients, and that it was his intention to increase the equipment of these units and to operate them with a capacity of 1,000 beds each.¹⁶ This increased capacity was effected in General Pershing's project of the rear which he sent by cable to the War Department during the following month.

In addition to the increase in capacity of base hospitals from 500 to 1,000 beds, a crisis expansion of 1,000 beds was provided for by the use of tents.¹⁷ Thus there came to be two kinds of bed capacity: normal and crisis expansion. It was only upon the normal bed capacity, however, that the ratio of hospital beds to troops was based.¹⁸

HOSPITAL CENTERS

Since hospital centers comprised an aggregation of base hospitals, their separate bed capacities were not fixed. They possessed an elasticity, in so far as hospital beds were concerned, that was limited, on the one hand, by available ground where buildings constructed in situ were to be used, and, on the other hand, by available buildings where these were to be used, for example, at Vichy.

At a number of points several—i. e., from 2 to 11—base hospitals were grouped physically in hospital centers, and accommodations for much larger formations were under construction when the armistice was signed.

The largest of these hospital centers were at Mesves, Mars, Savenay, Bordeaux, Bazoilles, Rimaucourt, Beaune, Allerey, Nantes, Brest, and Limoges, whereas in Paris the hospitals were grouped administratively as one center. The principal hospital centers in existing buildings were Vichy (hotels), Toul (casernes), Clermont-Ferrand, Vittel-Contrexeville, and Cannes.

CAMP HOSPITALS

Camp hospitals had an authorized capacity of 300 beds and crisis capacity in emergencies,¹⁶ but some were much larger; e. g., No. 26, which served the first replacement depot at St. Aignan, and had a capacity of 2,200 beds,¹⁹ and Camp Hospital No. 52 at Le Mans, which had a capacity of 2,300.²⁰

AMERICAN RED CROSS HOSPITALS

American Red Cross military hospitals and convalescent homes were a valuable asset to the American Expeditionary Forces, particularly in Paris, where up to the time of the Chateau-Thierry operation the Medical Department was not allowed to establish hospitals.² Their bed capacity was variable. After July 1 the Medical Department did establish many hospitals in and around Paris and on November 11 arrangements were under way by which we would have had 20,000 beds in that city.²¹ Other notable Red Cross hospitals were at Beauvais, Juilly, Jouy-sur-Marne, Toul, Froidos, and Glorieux, as well as convalescent homes for officers, nurses, and men.

RATIO OF BEDS

In the early summer of 1917 the hospitalization question concerning the American Expeditionary Forces naturally divided itself into two distinct problems: Hospital accommodations to meet the immediate needs of the sick of the American troops in France; the provision of hospitals for the care of the wounded to be expected when our troops became actively engaged in the front line.

As it obviously was impossible for us to construct hospitals in time to meet our immediate needs, the French were asked to relinquish to us accommodations of this character wherever they were needed.² To these requests they willingly acceded.

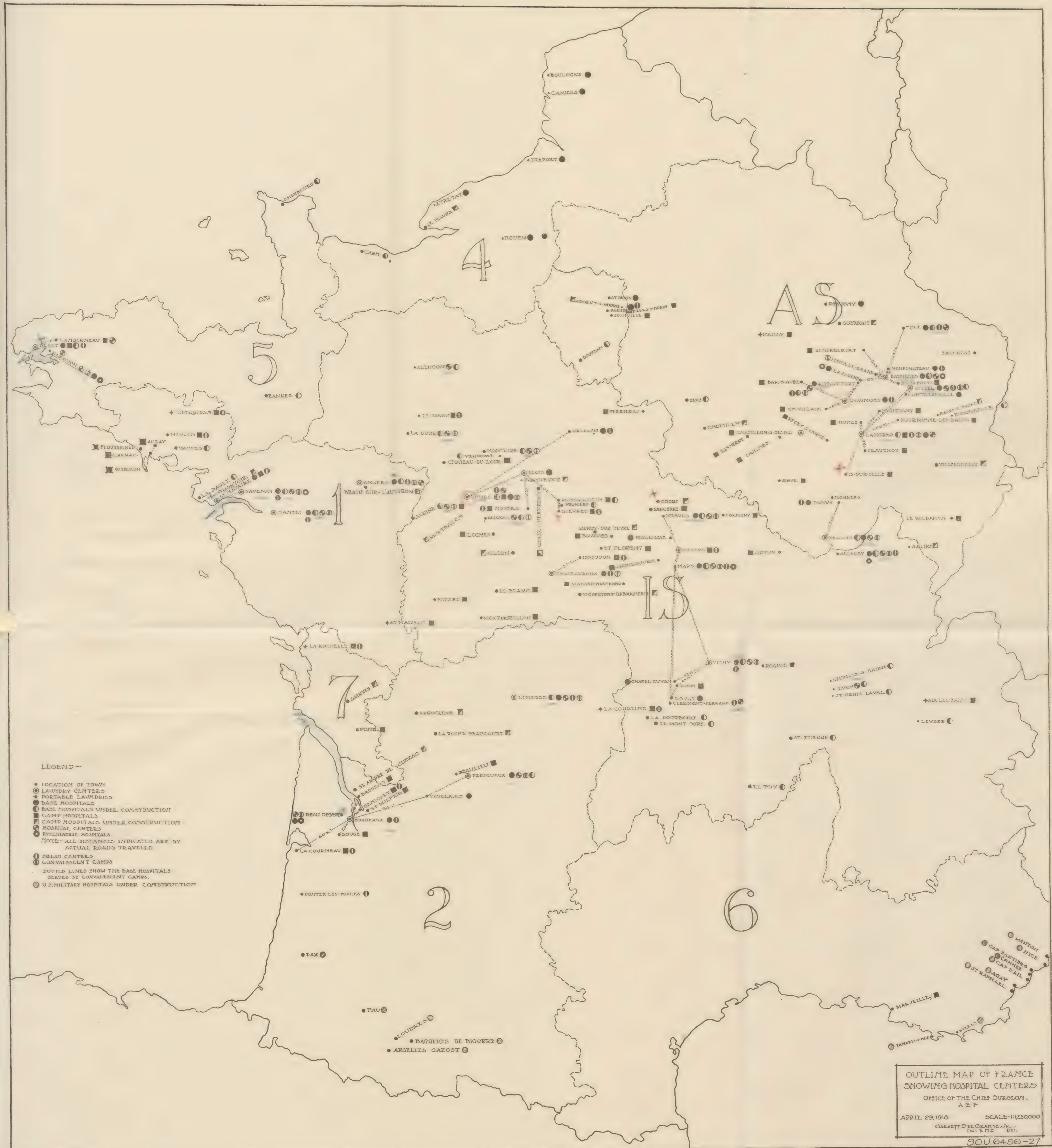


FIG. 79.—Outline map of France, showing the location of the various fixed hospitals of the American Expeditionary Forces

After the French had met the initial needs of our service in the transfer of hospital facilities, they urged that we prepare a hospitalization program in which we would outline what we considered necessary to meet both present and future needs.²² They did not seek to influence the terms of the program, but sought chiefly to learn the number of beds that the American Army would require as well as their geographical distribution in order that they might promote our projects and coordinate a similar plan of their own with ours. Accordingly, on July 8, 1917, representatives of the chief surgeon's office, A. E. F., and of the French Medical Service held a conference whose purpose was the study



FIG. 80.—American Red Cross Military Hospital No. 21, Paignton, Devon, England

of a project to provide 50,000 beds, which it was the intention of headquarters, A. E. F., to locate in France during 1917.²³

This number of beds was considered by the chief surgeon as being too small to use in connection with a project, in view of the inevitable delay in securing sites and completing necessary construction work; therefore on August 2 he recommended in its stead that not less than 100,000 beds be provided, using 500,000 troops as a basis for his estimates.²⁴ At this time the general staff was willing to agree to the chief surgeon's estimate in part only;²⁵ that is to say, no fault was found with the proportion of the number of beds to be supplied, but, since it was believed that there had been an inadequate time for mutual research and study, there was a possibility of error which would be minimized

in a basic number smaller than 500,000 troops. Therefore, the application of the chief surgeon's percentages was made to a force of 300,000 men, thus providing for 73,000 beds.

Since there must be a correlation of the provision of beds and personnel with which to operate them, and further, since the bringing of personnel to France had been placed on a phase basis, it is not surprising that headquarters, A. E. F., should adopt a similar basis for hospitals. This was done in mid-October, 1917.² Hospital beds were now allowed on the basis of 10 per cent of



FIG. 81.—American Red Cross Convalescent Hospital No. 101, Lingfield, Surrey, England. (For officers)

our total forces in Europe for a given phase, with an additional 10 per cent for troops in combat. It was anticipated by the general staff that not more than four of the five corps concerned would be engaged simultaneously, consequently the above allowance would approximate 15 per cent hospital beds for ordinary needs and 25 per cent for maximum needs, in addition to the beds of the divisional field hospitals.²²

The provision of base hospitals according to the successive increment of forces was tabulated as follows:

American Expeditionary Forces hospitalization program—estimated beds required

Phase	Item	Troops	Strength	Normal hospitaliza- tion, 10 per cent	Combat hospitaliza- tion, 10 per cent additional	Total hospital- ization		Hospitals			Maximum	Ordinary accumula- tive	Maximum accumu- lative
						Required	Accumula- tive	Base	Veneal	Evacuation			
First	1	Line of communication troops...	83,000	8,300	---	8,300	8,300	6	1	---	7,000	13,000	7,000
	2	Army troops and aviation.....	22,000	2,200	---	2,200	10,500	---	---	---	---	---	---
	3	First Corps.....	174,000	17,400	---	17,400	27,900	12	---	---	12,000	24,000	19,000
	4	Army troops and aviation.....	25,000	2,500	---	2,500	30,400	---	---	---	---	---	---
Total.....			304,000	30,400	---	30,400	77,100	18	1	---	19,000	37,000	26,000
Second	5	Line of communication troops...	73,000	7,300	---	7,300	37,700	6	2	---	8,000	14,000	27,000
	6	Second Corps.....	178,000	17,800	17,400	35,200	72,900	24	---	12	31,000	55,000	58,000
	7	Army troops and aviation.....	231,000	3,100	---	3,100	76,000	---	---	---	---	---	---
Third	8	Line of communication troops...	52,000	5,200	---	5,200	81,200	5	2	---	7,000	12,000	65,000
	9	Third Corps.....	177,000	17,700	17,800	35,500	116,700	24	---	12	31,000	55,000	96,000
	10	Army troops and aviation.....	32,000	3,200	---	3,200	119,900	---	---	---	---	---	---
Fourth	11	Line of communication troops...	41,000	4,100	---	4,100	124,000	4	2	---	6,000	10,000	102,000
	12	Fourth Corps.....	177,000	17,700	17,700	35,400	159,400	24	12	---	31,000	55,000	133,000
	13	Army troops and aviation.....	29,000	2,900	---	2,900	162,300	---	---	---	---	---	---
Fifth	14	Line of communication troops...	27,000	2,700	---	2,700	165,000	3	2	---	5,000	8,000	138,000
	15	Fifth Corps.....	177,000	17,700	17,700	35,400	200,400	24	---	12	31,000	55,000	169,000
	16	Army troops and aviation.....	21,000	2,100	---	2,100	202,500	---	---	---	---	---	---
Sixth	17	Line of communication troops...	16,000	1,600	17,700	19,300	---	6	1	12	14,000	20,000	14,000
Total.....			---	---	---	---	---	---	---	---	183,000	321,000	183,000
Convalescent camps and depots.....			---	---	---	---	---	---	---	---	17,000	17,000	17,000
Grand total.....			---	---	---	---	221,800	138	10	60	200,000	338,000	200,000

* 15,000 aviation.

In forwarding this program to the chief surgeon, the adjutant general, A. E. F., stated that since the whole question of the strength of the American Expeditionary Forces was dependent upon the amount of tonnage that might be placed by our Government in the trans-Atlantic transport service, and that accurate information on this particular subject would not be available for some time, the commander in chief, A. E. F., was not prepared to take any definite action beyond such authorization for providing hospitals as had already been given.²⁶ The study was believed to be complete enough to warrant consideration by the chief surgeon with a view of making such recommendations as he desired.

In his analysis of this program, the chief surgeon pointed out that there were two factors which must be taken into consideration as having a possible modifying influence on the result arrived at:²⁷ First, the basic principle on which the program was founded was that the personnel of each base hospital unit could care for 1,000 patients; second that a base hospital unit in an emergency, could increase its capacity from 1,000 beds to 2,000 beds by the use of tentage. As to the first, the base hospital unit obviously could not care for 1,000 patients if it became necessary to divide the units into small detachments in order to fit them into small existing buildings which might be taken over from the French. As to the second factor, the emergency expansion could not be considered as being possible were existing buildings such as schools and hotels to be taken over and used as hospitals, in view of the fact that in connection with most of these buildings there was inadequate ground space for expansion. Even if there were the necessary ground space, the lack of usual hospital facilities, by additionally burdening the personnel, would almost make expansion out of the question.

On December 15, 1917, the chief surgeon reported to the commander in chief, A. E. F., that in so far as the Medical Department was concerned, the project of 73,000 hospital beds along the line of communications had been accomplished.²⁸ In this accomplishment, he had found that adherence to a fixed numerical fractional program had caused much confusion and delay in the acquisition of sites and labor and in the placing of material. It was thus obvious that hospital construction on a definitely prescribed percentage basis could not keep pace with the arrival of troops. In the absence of authorization to perfect plans for a progressive hospitalization program looking far into the future, it was impossible to provide in time the necessary hospital facilities eventually required. For this reason the chief surgeon recommended that hospital construction be authorized on the basis of the strength of an army rather than in proportion to increments of troops. Such authorization, he pointed out, would permit the development of a much more comprehensive plan of hospitalization than the phase or progressive fractional plan. This program was to contemplate the ultimate provision of a total of 200,000 hospital beds, ordinary capacity.

Pursuing this question further, a medical representative of the chief surgeon, G-4, G. H. Q., A. E. F., made an analytical study of the resources and limitations of hospitalization. The result of this study was submitted to the general staff on March 31, 1918, together with a recommendation that there be authorized an automatic bed allowance which would recognize that six months would be necessary to complete a project.²⁹ It was also recommended that the Medical Department be authorized to arrange for new hospital accommodations on the basis of 12,000 beds a month, which would be acquired either through acquisition of existing buildings or by new construction. These recommendations were not approved at the time, and until a new policy was announced it was necessary for the Medical Department to take up direct with the general staff any new project for which new construction was necessary.

At this time 45,300 beds were allowed on the strength of the troops present, 1 corps—i. e., 300,000 men—but of these beds there were actually available in the hospitals of the American Expeditionary Forces only 21,340, leaving a shortage of 23,960.² Projects then under way to meet the needs of present and prospective strength would provide for a total of 118,930 beds when completed.²

On June 1, 1918, headquarters, A. E. F., authorized the Medical Department to maintain an actual current bed status aggregating 15 per cent of the total strength of the American Expeditionary Forces.¹³ In effect, this was approximately the same percentage that previously had obtained—that is, 10 per cent for total forces and 10 per cent additional for combat forces—however, in reality, the establishment of the flat rate tended to avoid future conflict of opinion as to the ratio of combat and other troops. This latest numerical allowance was to include the accommodations in all fixed hospitals, irrespective of type, as well as in convalescent camps, and the computation was to be made on the basis of ordinary capacity.

Since it now was well recognized that projects involving new construction could not ordinarily be available for occupancy before the lapse of at least six months, and that the provision of adequate hospital accommodations must

keep pace with the arrival of troops, headquarters authorized the Medical Department an additional credit of 90,000 beds over the 15 per cent referred to, in order that it could make timely anticipation of its future needs. In utilizing this credit the Medical Department was to write off approximately one-sixth of it monthly.¹³

LOCATION OF HOSPITALS; PROGRESS IN HOSPITALIZATION

The first program for the location of hospitals of the American Expeditionary Forces, formulated by the chief surgeon, A. E. F., in the summer of 1917, was, of necessity, tentative for the reason that before it could be adopted certain factors must definitely be decided upon, especially the sector of the front which the American forces would occupy, and the main railway lines and ports which would afford means of communication.² Up to the fall of 1917, the chief surgeon had not received any definite information concerning the sector our troops eventually would occupy at the front;² however, as delay could not be countenanced, he proceeded on the assumption that our principal bases must be St. Nazaire and Bordeaux, and that our sector would be in Lorraine, in the vicinity of the training areas (Gondrecourt, Neufchateau, Mirecourt, and Le Valdahon) in which they were placing our troops.² This assumption indicated, in turn, what probably would be our lines of communications, and events proved that these early conjectures generally were correct. The American sector eventually occupied extended from west of Verdun to east of Belfort,³⁰ and the base ports most utilized were Bordeaux, La Rochelle, St. Nazaire, and Brest.³¹

While estimates of the number of troops that would be used in the American Expeditionary Forces were being formulated by general headquarters, A. E. F., the hospital program was being furthered, inspections for possible hospitals were continued and arrangements made for obtaining buildings which were suitable for hospital purposes, and, so far as could be estimated, properly located near St. Nazaire, Bordeaux, the training areas mentioned above and along the railway lines between them and the ports.² In carrying out this project studies were made of prospective hospital sites in or near the following places: Nantes, Angers, Tours, Romorantin, Bourges, Gievres, Nevers, Beaune, Dijon, Langres, Chaumont, Martigny, Neufchateau, Vittel, Contrexeville, Bordeaux, Perigueux, Limoges, Chateauroux, St. Nazaire, Savenay, La Rochelle, Cerey-la-Tour, Le Valdahon, Besançon, Rigny-les-Salles, Cosne, Ourches, Epinal, and Sens.²⁸ The Engineer and the Medical Departments concurred in the belief that Bordeaux and St. Nazaire were the most desirable ports, since in both places there were good facilities for docks, large base hospitals, camps, and water supply.

As stated above, the first allowance for hospital beds made by general headquarters, A. E. F., was 73,000.²⁵ As to the location of these, headquarters directed that a joint study be made by the chief quartermaster, the chief surgeon, and the chief of engineers, A. E. F., which resulted in the geographical distribution of hospital beds as follows: 14,000 beds in the advance section, 21,000 beds between Tours and the French zone of the armies, 38,000 beds from Tours westward.

The chief surgeon, A. E. F., now proposed that such construction for hospitals be located as follows, the several establishments in each section being entered on this list, in order of their preferability: ²

	To be con- structed (beds)	Existing build- ings (beds)		To be con- structed (beds)	Existing build- ings (beds)
Advance section (14,000 beds):			Base section (38,000 beds):		
1. Bazoilles-sur-Meuse		800	1. Tours	2,000	0
2. Bazoilles-sur-Meuse	5,000	0	2. Perigueux	5,000	0
3. Bazoilles-sur-Meuse	1,000	0	3. Vauclaire	0	1,000
4. Chaumont		2,500	4. Talence	400	600
5. Bologne			5. Angers	700	300
Intermediate section (21,000 beds):			6. Nantes	2,000	0
1. Dijon	700	300	7. Savenay	700	300
2. Dijon	5,000	0	8. St. Nazaire	300	200
3. Beaune	1,000	100	9. La Boule	5,000	0
4. Moulins	2,000	0	10. La Rochelle	5,000	0
5. Vichy	3,000	0	11. Bordeaux	3,000	0
6. Chateauroux	400	600	12. Poitiers	1,000	0
7. Limoges	600	400	13. Angouleme	1,000	0

On October 6, the commander in chief, A. E. F., wrote the French military mission in part as follows: ³²

The attached letter shows in detail the program that is now being carried out by the Medical Corps, American Expeditionary Forces. It shows the immediate necessity of providing hospital facilities for 73,000 beds in the zone of the line of communications. It shows also the general areas in which it is desired to locate the various hospitals with the desired bed capacity of each.

It is believed, however, that during the preliminary phases of our operations here we will be forced to use existing buildings, hotels, etc., as hospitals pending the construction of new hospitals, notwithstanding their disadvantages. This is on account of the shortage of construction material.

The most practical plan for us to follow, it is believed, is to make use temporarily of the existing facilities and at the same time push new construction as fast as possible. The sites for construction of hospitals must be at points where the available ground will permit of large expansion and where the railroad evacuations will be best met.

It is therefore requested that we be given the benefit of the opinion of the French authorities on this entire question at as early a date as practicable. Please include lists of available buildings in the zone of the line of communications of these forces, not including those listed in the attached letter, suitable and available for hospitalization. At the same time, please give your recommendations as to location of definite sites for construction of hospital centers.

From the attached letter the difficulties that the Medical Corps, American Expeditionary Forces, have had in their endeavor to procure hospital accommodations and sites are clearly presented. It is requested that this matter be immediately taken up and that these headquarters be informed as to what steps it should take with reference to placing the proper representatives of the Medical Corps in relation to representatives of the French Government, to the end that any further delay in providing hospitals for these forces be prevented.

On October 8, 1917, the chief surgeon informed the chief of staff, A. E. F., that the commander in chief of the French Armies had stated that it would be necessary to hold a conference to establish a program of hospitalization. ³³ He added that a working basis concerning this subject in the French zone of the interior had been reached between his office and that of the French Medical Service, but that until a similar arrangement could be made for hospitalization in the zone of the armies, but little progress could be made in

providing the absolutely necessary hospital facilities in that jurisdiction. He therefore recommended that the proposed conference between representatives of the French and American services for the consideration of hospitalization be held at the earliest practical moment.

On October 11, the commander in chief wrote to the chief of the French military mission calling attention to the need of hospitalization in the American Expeditionary Forces and to the necessity for immediate steps to provide adequate hospital facilities. He recommended that a conference be called at the earliest possible moment.³⁴ Accordingly a conference was held at Chaumont, October 17, between representatives of the American and French Armies, when the following conclusions were reached:³⁵

Seventy-three thousand beds should be provided for a force of 300,000 men. In order to shorten the journey for wounded and to effect economies in transportation, equipment, personnel, the general distribution of beds proposed by the general staff (13,000 in the advance zone, 21,000 in the intermediate, and 39,000 in the bases) should be modified, so that 40,000 beds would be located in the intermediate zone and 20,000 in the zone of the bases. The intermediate zone would be included (roughly) in the area bounded by Sens (exclusive), Orleans, Tours, Dijon, Lyon. Sanitary installations would not be restricted to the lines of communication only, but might also be developed on subsidiary branches of these lines. This arrangement would secure treatment of slight cases in the zone of the advance, of more serious cases in the intermediate zone and of the very serious cases, including those returnable to the United States, in the zone of the bases. Inspections with a view of locating suitable hospital sites would be undertaken jointly, by the Americans and French without delay and installations would be sought not only on the direct lines of communication but in subsidiary lines as well. In the zone of the armies, formations then held by the French would be turned over with their equipment to the American service as soon as its troops entered the sectors these formations served, while regional installations would be, in principle, retained under the general jurisdiction of the territory they served, the transfer being decided according to circumstances in each case.

The report of the conference further reads as follows:

Hospitals in the zone of the armies: In regard to the 10 division camp hospitals which the American staff proposed to establish as hospitals of 300 beds apiece with extension possibilities to 1,000 beds, the French staff thinks that it would be advisable, in order to obtain immediately and at the lowest cost the necessary buildings for the hospitalization of the sick, to provide each zone with places for cantonment infirmaries in each of the existing cantonments, and to use, for supplementary needs, the French hospitals which would be handed over to the Americans in the zones in question and to which evacuations could be made by motor ambulances. In this connection a list of hospitals containing from 7,000 to 8,000 beds was handed the representative of the chief surgeon. These hospitals will be handed over progressively to the American Medical Service concurrently with the arrival of 300,000 men.

	Beds		Beds
Vaucouleurs	50	Liffol	100
Mandres	220	Martigny	850
Ourches	500	Contrexeville	1, 080
Rigny	600	Vittell	1, 820
Chalaines	220	Bazoilles (already turned over)	1, 040
Mirecourt	240		
Neufchateau (300 beds having already been handed over)	900		

It is also considered expedient to utilize as far as possible at the present time all available structures, such as chateaux and large buildings. In regard to the hospitals which are to be built, sites are to be searched for on the lines, Bricon-Chatillon, Chatillon-Troyes, Chalindrey, Boulogne-Rimaucourt.

4. *Hospitals in the zone of the interior.*—After the examination made of the projects entertained by the American staff in regard to the French hospitals which are to be taken over and hospitals to be built, the conclusion is reached that in dealing with numbers of beds as detailed in page 1 it is advisable only to use, in selecting important hospital centers, such plants or places that can be cleared by railroad service. In this respect sites for large hospitals will be suggested and searched for (subject to the approval of the commander in chief, A. E. F.).

(1) In the intermediate zone, sites will be located in the district of Cercy-la-Tour, of Clamecy, of Autun, of Avallon, etc.

(2) In the zone of the bases, sites will be located in the district of Redon and Auray in the northern area and in the district of Bordeaux and Arachon in the southern area. The sites to be utilized and the hospitals in the interior which are to be taken over will be made the subject of studies and agreements, to be concluded, in each case, between the undersecretary of state of the service de santé and the general staff of the Army (fourth bureau, on the one hand, and the American staff, on the other).

5. It is agreed that this study is based on the requirements of 300,000 men and that a new conference will be held in due course for a discussion of the needs of larger numbers of effectives.

With this report was included a statement of the hospitals which had been and which would be turned over to the American Expeditionary Forces and the bed capacity of each. These were as follows:

1. INSTRUCTION CAMPS

Gondrecourt (turned over August, 1917):	Beds
Wooden barrack hospital capacity-----	180
Can be increased by additional-----	70
	<hr/> 250
Bazoilles-sur-Meuse (turned over July 4, 1917), formerly the Bazoilles Hospital (direction Etapes group of the Armies of the East): Wooden barrack hospital-----	1,000

2. ZONE OF THE BASES

St. Nazaire (turned over July 6, 1917):	
Boys' school (formerly Surgical Hospital 59)-----	292
Eleventh region, possible extension of-----	208
	<hr/> 500
Camp infirmary, eleventh region-----	100
	<hr/> 600
Savenay (turned over Aug. 8, 1917):	
Normal school for teachers (formerly Surgical Hospital 14)-----	300
Possible extension-----	700
	<hr/> 1,000
Brest (placed at the disposal, on June 17, 1917, of American patrol crews.	
Bordeaux (turned over Aug. 8, 1917): Small school of Talence (formerly Surgical Hospital 25)-----	1,083
	<hr/> 1,083
Eighteenth region—40 Adrian barracks have been asked for the personnel.	

3. INTERMEDIATE ZONE

Angers (turned over Sept. 3, 1917):	
Small girls' school (formerly Surgical Hospital 58)-----	470
Ninth region, possible extension-----	530
	<hr/> 1,000

Chateauroux (turned over Aug. 22, 1917):	Beds
Retreat for mental affected (Surgical Hospital 23)-----	810
Ninth region, possible extension-----	190
	<u>1,000</u>
Dijon (turned over Aug. 8, 1917):	
Theological school (formerly Surgical Hospital 77)	546
Eighth region, possible extension-----	455
	<u>1,000</u>
Limoges (turned over Sept. 3, 1917):	
Haviland factory (formerly Hospital du Mas Loubier—Surgical Hospital 49)----	510
Possible extension-----	490
	<u>1,000</u>
Paris (in process of being turned over): Formerly Red Cross Hospital, 6 Rue Piccini.	300

5. ZONE OF THE ARMIES

Chaumont (in process of being turned over): Artillery barracks (Surgical Hospital 28)	
twenty-first region-----	2,800
Two Adrian barracks have been requested for operating rooms.	
Neufchateau (Rebeval Barracks)-----	300

HOSPITALS THAT WILL EVENTUALLY BE TURNED OVER TO AMERICAN EXPEDITIONARY FORCES

Nantes, Grand Lycée de Nance (schoolhouse): Eleventh Region Complementary	
Hospital No. 21-----	500
Perigueux, Vauclaire Abbey: Twelfth region departmental establishment, not occupied	
by the service de santé, which should be turned over to American Expeditionary	
Forces.	
Limoges: Seminary.	
Tours: Chateau St. Victor (to build), ninth region.	
Perigueux: Mallet property (to build), twelfth region.	
Bordeaux: Chateau Raoul et Chateau des Iris, eighteenth region.	
Dijon: Porte Neuve station, eighth region.	
Nantes: Grand Blottreau, eleventh region.	
La Rochelle: Land between Lallen and La Pallice, thirteenth region.	
Beaune: Eighth region.	
Peppignan: Hospital (part finished)-----	600

The report of this conference was accepted by the administrative section, general staff.² Concerning this program the chief surgeon wrote as follows on October 19, 1917.³⁶

OCTOBER 19, 1917.

Memorandum for the C. of S.

Subject: Hospitalization.

1. The conference of October 17, 1917, referred to in attached memorandum brings up three points for consideration:

(a) The acceptance of certain French hospitals located to the north and east of Neufchateau.

(b) Changing the figures accepted by the general staff, from 38,000 beds in the base section and 21,000 beds in the intermediate section, to read 21,000 beds in the base section and 38,000 beds in the intermediate section.

(c) The enlargement of the intermediate section to take in the territory shown on the attached map.

2. All of these propositions meet with my approval. The acceptance of the hospitals offered by the French appears at this time to be a matter of necessity. The enlargement of the intermediate zone opens a considerable field where existing French hospitals suitable for our purposes may be found.

3. The accompanying map shows very clearly the lack of existing French hospitals in the southwestern part of the divisional training areas, consequently as stated in the attached memorandum hospital facilities can be provided only by construction.

4. In paragraph 1-A of the attached memorandum the statement is made that 7,000 beds now existing in the French hospitals are available to the American Expeditionary Forces. Attention is invited to the fact that while the French hospitals shown on the map attached total, according to the figures, 7,233 beds, 1,510 beds have already been turned over to the American Expeditionary Forces and are not to be counted. This leaves 5,700 beds which it is stated are available. From information now at hand it appears that one of these proffered hospitals belongs to the civil community and can not be disposed of by the G. Q. G.

5. This number will be further reduced through the fact that it appears probable from information now at hand that some of these smaller hospitals can not be used by the American Expeditionary Forces. In addition, the capacity of the hotels at Contrexeville, Martigny, and Vittel is listed differently by the French for summer and winter; i. e., certain of the hotels were built for summer use only and it has been possible to occupy only a part of the buildings in winter time. The figures given above are the summer capacity.

6. It is recognized that in the present emergency anything that offers shelter for patients must be used. However, in concurring in this memorandum it is with the reservation that the use of such buildings as the French have offered can be considered only as an emergency measure and in no wise meets, from our point of view, the demands for adequate hospital facilities. The very serious obstacles to the use of buildings now employed by the French as emergency hospitals was indicated in detail in my letter of September 27, 1917, on the general subject of hospitalization.

A. E. BRADLEY,
Brigadier General, Chief Surgeon.

On October 23 the following hospitals were under the control of the chief surgeon, A. E. F.:³⁷

American Red Cross Military Hospital No. 1, Neuilly.

Base Hospital No. 6, A. E. F., Bordeaux.

Base Hospital No. 8, A. E. F., Savenay.

Base Hospital No. 9, A. E. F., Chateauroux.

Base Hospital No. 15, A. E. F., Chaumont.

Base Hospital No. 17, A. E. F., Dijon.

Base Hospital No. 18, A. E. F., Bazoilles.

Base Hospital No. 101, A. E. F., St. Nazaire.

Base Hospital No. 27, A. E. F., Angers.

Base Hospital No. 39, A. E. F., Limoges.

Base Hospital No. 2, care of General Hospital No. 1, British Expeditionary Force, Etretat.

Base Hospital No. 4, care of General Hospital No. 9, British Expeditionary Force, Rouen.

Base Hospital No. 5, care of General Hospital No. 13, British Expeditionary Force, Camiers.

Base Hospital No. 10, care of General Hospital No. 16, British Expeditionary Force, Treport.

Base Hospital No. 12, care of General Hospital No. 18, British Expeditionary Force, Camiers.

Base Hospital No. 21, care of General Hospital No. 12, British Expeditionary Force, Rouen.

CAMP HOSPITALS ESTABLISHED OR TO BE ESTABLISHED

First divisional training area, Camp Hospital No. 1, A. E. F.
 Second divisional training area, Camp Hospital No. 2, A. E. F.
 Third divisional training area, Camp Hospital No. 3, A. E. F.
 Fourth divisional training area, Camp Hospital No. 4, A. E. F.
 Fifth divisional training area, Camp Hospital No. 5, A. E. F.
 Sixth divisional training area, Camp Hospital No. 6, A. E. F.
 Seventh divisional training area, Camp Hospital No. 7, A. E. F.
 Eighth divisional training area, Camp Hospital No. 8, A. E. F.
 Ninth divisional training area, Camp Hospital No. 9, A. E. F.
 Tenth divisional training area, Camp Hospital No. 10, A. E. F.
 Camp hospital established at St. Nazaire, Camp Hospital No. 11, A. E. F.
 Camp hospital established at Le Valdaon, Camp Hospital No. 12, A. E. F.
 Camp hospital to be established at Maily, Camp Hospital No. 13, A. E. F.
 Camp hospital to be established at Issoudun, Camp Hospital No. 14, A. E. F.

Not until October 31 did the chief surgeon receive the approval of the chief of staff of the conclusion reached at the conference of October 17.³⁸ In the meantime very little could be accomplished in the prosecution of the hospitalization program because of the fact that it was necessary to have the approval of the commander in chief, A. E. F., before hospitals offered by the French could be accepted. These hospitals were particularly those in the region of Vittel, Contrexeville, and Martigny. Previously the general staff, A. E. F., had notified the chief surgeon that hospitalization projects should keep to the west of the general area in which these places were located.²⁵

On October 31, 1917, the chief of staff telegraphed the approval of the commander in chief concerning the hospitalization project of October 17.³⁹ The chief of staff drew especial attention to that portion of his approval which pertained to the utilization of existing buildings. The next day the commander in chief approved this project in the following terms:⁴⁰

A. S., G. S., *November 1, 1917.*

From: Commander in Chief.
 To: Chief, French Military Mission.
 Subject: Hospitalization.

1. I have the honor to inform you that the hospitalization project contemplated in the conference held at the French mission October 17, 1917, meets with the approval of the commander and chief as follows:

(a) Acceptance of existing hospitals offered in the zone of the armies, to be taken over as required.

(b) Acceptance of the area Sens (exclusive)—Orleans—Tours—Dijon—Lyon for hospitalization in the intermediate area, subject to remarks given below.

(c) Acceptance of the altered distribution of the 73,000 beds in the first program so as to give about 40,000 in the intermediate section and about 20,000 in the base sections.

(d) Acceptance of the plan to seek sites for construction of hospital centers in the general areas indicated in the conference; i. e., for the advance section in the vicinity of Is-sur-Tille, Champplitte, Andilly, Boulogne, Chatillon, etc., for the intermediate section in the vicinity of Cerey-la-Tour, Autun, Avallon, and Clamecy, and for the base sections in the vicinity of Bordeaux, Redon, and Auray.

2. With reference to (c) above, and in view of the necessity of utilizing existing buildings to the maximum, it is considered advisable that the areas in which such buildings may be located include also the vicinity of the American line of communications from Tours to St. Nazaire and Chateauroux to Bordeaux.

3. The commander in chief in giving his approval of the project for hospitalization lays special emphasis on the fact that, on account of the scarcity of shipping and difficulty of obtaining material, every effort should be made to obtain existing buildings and that where construction is necessary it must be of the simplest character possible consistent with necessities. It is, therefore, requested that the facilities in existing hospitals or buildings which can be offered be made the maximum possible.

4. It is the understanding that, as soon as possible, the French authorities will furnish preliminary studies of the question of existing hospitals and other buildings in the interior and of sites for hospital construction in the three sections, as indicated under (d) above, which can be utilized by the American Army.

5. With regard to areas for construction of hospitals, it will be necessary to consider carefully the location of such hospital centers in order to avoid interference with storage depots, training areas, etc., and in order to permit this study to be made it is desirable to have the suggestions of the French authorities as early as practicable. As soon as the French authorities are ready I shall take pleasure in having the American representatives confer with their representatives to fix definite locations for these hospitals.

By direction:

W. D. CONNOR, *Acting Chief of Staff.*

As of December 15 the following reports were submitted to the general staff concerning hospital status:²⁹

Hospitals authorized in approved project now established and receiving or ready to receive patients

Item index	A. E. F. designation	Location	How acquired	Number of units	Present bed capacity	Eventual total ordinary bed capacity when completed	Remarks
Camp hospital:							
1	No. 1	Gondrecourt	By transfer from French	1	250	300	Now under construction. To be turned back to France. Do. Ready in about one month. Requisition necessary
2	No. 2	Neufchateau	do	1	500	500	
3	No. 3	La Fauche	New construction by engineers A. E. F.	1	300	300	
4	No. 4	St. Nazaire	do	1	100	300	
5	No. 11	Le Valdaon	By transfer from French	1	300	300	
6	No. 12	Maily	do	1	300	300	
7	No. 13	Issoudun	New construction by engineers A. E. F.	1	300	300	
8	No. 15	Coetquidan	By transfer from French	1	300	300	
9	No. 16	Chalaines	do	1	220	220	
10	No. 17	Burey en Vaux	do	1	100	100	
11	No. 18	Laffol le Grand	do	1	100	300	
12	No. 19	La Courtine	do	1	300	300	
13	No. 20	Souge	do	1	300	300	
14	No. 21	Bourbonne-les-Bains	By leasing hotels	1	200	200	
15	Total camp hospitals				14	3, 270	4, 020
Base hospital:							
16	No. 6	Bordeaux	By transfer from French	1	500	1, 300	Occupied by skeleton unit.
17	No. 8	Savenay	do	1	450	1, 000	
18	No. 9	Chateauroux	do	1	563	1, 000	
19	No. 15	Chautmont	do	1	1, 141	1, 200	
20	No. 17	Dijon	do	1	221	1, 000	
21	No. 18	Bazoilles	do	1	723	750	
22	No. 27	Angers	do	1	314	1, 000	
23	No. 36	Vittel	By leasing hotels	1	700	1, 000	
24	No. 39	Limoges	By transfer from French	1	103	350	
25	No. 101	St. Nazaire	do	1	419	1, 000	
26	Naval No. 1	Brest	do	1	400	400	
27	Total base hospitals				11	5, 534	10, 000
American Red Cross Military Hospital:							
28	No. 1	Paris	do	1	650	650	Under agreement with French Government. This hospital treats only French personnel. It is not available for Americans. Under agreement with French Government 100 beds are exclusively reserved for French patients. Exclusively reserved for officers and Red Cross personnel.
29	No. 2	do	do	1	300	300	
30	No. 3	do	do	1	50	50	

^a These hospitals are operated in conjunction with American Red Cross at their expense.

Hospitals authorized in approved project, but not yet ready for occupancy

Item index	Type of hospital unit, or A. E. F. designation	Location	How to be acquired	Number of ordinary units authorized to be provided	Remarks
	Camp hospital:				
1	No. 3	Bourmont	New construction by engineers, A. E. F.	1	Now nearing completion.
2	No. 5	Vaucouleurs	do	1	One-half completed.
3	No. 6	Colombey	do	1	Site selected, construction not started.
4	No. 7	Humes	do	1	Do.
5	No. 8	Not determined	do	1	Do.
6	No. 9	Chateau Villain	do	1	Site can not be selected, until 8 D. T. A. is settled.
7	No. 10	Prauthoy	do	1	Site selected; construction not started.
8	No. (?)	Meucon	By transfer from French	1	Do.
9	No. (?)	Le Courneau	do	1	Do.
10	Total camp hospitals			9	2,700
11	Base hospital units	Bazouilles	New construction by engineers, A. E. F.	6	Authorized Sept. 18 and Oct. 19, work on one hospital under way.
12	do	Limoges	By leasing a seminary	1	Authorized Sept. 22; alterations now under way
13	do	Vaudaire	By lease of new civil hospital	1	Authorized Sept. 22; alterations and additions necessary.
14	do	Bordeaux	New construction by contractor	5	Authorized Nov. 8; see proposed projects (b).
15	do	Kimaucourt	New construction by engineers, A. E. F.	2	Authorized Nov. 12; see proposed projects (b).
16	do	Langres	do	2	Do.
17	do	Vitry	By leasing hotels	1	Authorized Nov. 12.
18	do	Coatreuxville	do	1	Do.
19	do	Nantes	do	1	Do.
20	do	Alleray	New construction by engineers, A. E. F.	10	Authorized Nov. 15; additions and alterations necessary.
21	do	Nesves	do	10	Authorized Dec. 12.
22	do	Beaune	do	10	Do.
23	do	Nars	do	10	Do.
24	do	Nantes	do	3	Authorized Dec. 13.
25	Total base hospitals			63	63,000

Additional hospitalization projects at the following-named places were also tentatively proposed at this time in order to meet further prospective needs.²⁸

Location	Ordinary bed capacity to be provided	Remarks
Rimaucourt	3,000	Tentatively authorized by adjutant general, A. E. F., Nov. 12.
Langres	3,000	Do.
Contrexeville	1,000	Additional hotels to be acquired.
Vittel	1,000	Do.
Veuxhaules	5,000	Site proposed by French general headquarters.
Chatillon-sur-Seine	5,000	Do.
Coublanc	5,000	Do.
Mirebeau	5,000	Do.
Martigny	1,000	Hotels to be acquired.
Bordeaux	15,000	Tentatively authorized by adjutant general, A. E. F., Nov. 8.
Savenay	4,000	
Severac, or Questembert, or Guemene-Penfao	5,000	Sites proposed by French fourth bureau.
Limoges	3,000	
Perigueux	5,000	
Tours	2,000	
Vichy	5,000	Hotels to be acquired.
Other sites not yet selected but to be chiefly in the intermediate zone	59,000	
Total	127,000	

It was believed now that a proper regional distribution of hospital facilities would be approximately as follows:²⁸ Advance section, 15 per cent; intermediate section, 60 per cent; base sections, 25 per cent.

The chief surgeon's office also reported that, as had been planned, hospitals were located in general in the training areas centered around Neufchateau, along the lines of communications, and at Bordeaux, St. Nazaire, and Brest.²⁸ Considerable hospitalization was necessary at base ports for the permanently disabled. In selecting sites, consideration had to be given also to such questions as availability of railroad sidings, situation at points where these formations would not interfere with the movement of troops, or those in training areas, and accessibility from camps and depots as well as from the front. Future experience, it was added, might show that some readjustments of these percentages might be necessary, but in any event these would serve as a basis for present plans and could be changed if the necessity arose.

On February 23 the chief surgeon forwarded to the Surgeon General the following data concerning the hospitalization facilities of the American Expeditionary Forces:⁴¹

ALPHABETICAL INDEX OF LOCATIONS, FIXED MEDICAL DEPARTMENT UNITS

Allerey: 10 type A, A. E. F. base hospital units under construction. Total ordinary capacity of this center to be 10,000 beds. Work in hands of French contractors and will soon be under way.

Angers: Base Hospital No. 27, with a capacity of 334 beds, in operation in old French hospital. Construction under way to increase capacity to 2,000 beds, thus providing for a special clinic for the treatment of "Diseases of the heart."

Bazailles: Base Hospital No. 18, with a capacity of 740 beds in operation in barrack hospital acquired from the French. Six type A, A. E. F. base hospital units under construction by the Engineer Corps. Total ordinary capacity of this center to be 6,740 beds.

Beaune: 10 type A, A. E. F. base hospital units under construction. Total ordinary capacity of this center to be 10,000 beds. Work in hands of French contractors and will soon be under way.

Blois: Camp Hospitals Nos. 25 and 26, with a total bed capacity of 430, in operation in old French hospitals.

Bordeaux: Base Hospital No. 6, with a capacity of 900 beds, in operation. Five type A, A. E. F. base hospital units under construction on Beau Desert site. This site will be the eventual center for the construction of a total of 20 type A, A. E. F. base hospitals with an ordinary capacity of 20,000 beds. Receiving and forwarding medical supply base No. 2. Base medical laboratory, base section No. 2, temporarily housed in Base Hospital No. 6.

Bourbonne-les-Bains: Camp Hospital No. 21, with a bed capacity of 200, in operation in hotel leased for hospital purposes.

Bourmont: Camp Hospital No. 3, with a bed capacity of 300 beds, in operation.

Brest: Naval Base Hospital No. 1, with a capacity of 407 beds, in operation in old French hospital. Camp Hospital No. 33, with a capacity of 500 beds, capable of expansion to 1,000 beds, in operation at Pontanezen Barracks. Receiving and forwarding medical supply base No. 5. Base medical laboratory, base section No. 5.

Burey-en-Vaux: Camp Hospital No. 17, with a capacity of 125 beds. Vacated because of evacuation of training area.

Chateauroux: Base Hospital No. 9, with a capacity of 817 beds, in operation in old French hospital. Base medical laboratory, base section No. 3 (intermediate section) temporarily housed in Base Hospital No. 9.

Chateau Villain: Base Hospital No. 9, with a capacity of 300 beds, under construction by Engineer Corps.

Chalaines: Camp Hospital No. 16, with a bed capacity of 220, vacated because of evacuation of training area.

Chaumont: Base Hospital No. 15, with a capacity of 1,414 beds, in operation in old French hospital.

Coetquidan: Camp Hospital No. 15, with a bed capacity of 525, in operation in an old French hospital.

Colombey: Camp Hospital No. 6, with a capacity of 150 beds, vacated because of evacuation of training area.

Contrexeville: Base Hospitals Nos. 31 and 32, with a capacity of 1,250 beds each, in operation in hotels, leased for hospital purposes.

Cosne: Intermediate medical supply depot No. 3.

Dijon: Base Hospital No. 17, with a capacity of 833 beds, in operation in an old French hospital. Central medical laboratory, on University of Dijon property.

Gievres: Intermediate medical supply depot No. 2.

Gondrecourt: Camp hospital No. 1, with a capacity of 300 beds, in operation in barrack hospital acquired from the French.

Humes: Camp Hospital No. 7, with a capacity of 300 beds, under construction by Engineer Corps.

Issoudun: Camp Hospital No. 14, with a capacity of 300 beds, in operation.

Is-sur-Tille: Advanced medical supply depot No. 1.

La Courcelles: Camp Hospital No. 38, with a capacity of 240 beds, ready for occupancy.

La Courtine: Camp Hospital No. 19, with a capacity of 300 beds, in operation in old French hospital.

La Fauche: Camp Hospital No. 4, with a capacity of 300 beds, ready for occupancy.

Langres: Five type A, A. E. F. base hospital units approved for this place. Acquisition of site still under consideration by the French. Camp Hospitals Nos. 22, 23, and 24, with a total capacity of 520 beds, in operation in old French buildings.

Le Courneau: Camp Hospital No. 29, with a capacity of 1,000 beds, in operation in old French hospital.

Le Valdahon: Camp Hospital No. 12, with a capacity of 300 beds, in operation in an old French hospital.

Limoges: Base Hospital No. 38, with a bed capacity of 242, in operation in old French hospital; two modified type A, A. E. F. base hospital units, with a capacity of 1,500 beds each, under construction by Engineer Corps. New Grand Séminaire, with alterations and additions under way to provide a capacity of 1,000 beds, will soon be occupied by a unit.

Liffol-le-Grand: Camp Hospital No. 18, with a capacity of 300 beds temporarily vacated.

Maily: Camp Hospital No. 13, with a capacity of 250 beds, in operation in old French hospital.

Mars: Ten type A, A. E. F. base hospital units under construction. Total ordinary capacity of this center to be 10,000 beds. Work in hands of French contractors and will soon be under way.

Mesves: Ten type A, A. E. F. base hospital units under construction. Total ordinary capacity of this center to be 10,000 beds. Work in hands of French contractors and will soon be under way.

Meucon: Camp Hospital No. 31, with a capacity of 500 beds, under construction by French engineers.

Montigny: Camp Hospital No. 8, with a capacity of 300 beds, under construction by Engineer Corps.

Nantes: Base Hospital No. 34, occupying Grand Seminary; alterations and additions under way to increase capacity to 1,000 beds. Three type A, A. E. F. base hospital units under construction on the Grand Blottereay site. Work in the hands of French contractors.

Neufchateau: Base Hospital No. 66, with a capacity of 735 beds, in operation in Rebeval Barracks. Army medical laboratory No. 1.

Nevers: Camp Hospital No. 28, with a capacity of 130 beds, in operation in old French hospital.

Paris: American Red Cross Military Hospitals, No. 1, with a capacity of 600 beds; No. 2, with a capacity of 186 beds, and No. 3, with a capacity of 50 beds.

Perigueux: Five type A, A. E. F. base hospital units under construction. Total ordinary capacity of this center to be 5,000 beds. Work in hands of French contractors and will soon be under way.

Prauthoy: Camp Hospital No. 10, with a capacity of 300 beds, now under construction by Engineer Corps.

Rimaucourt: Five type A, A. E. F. base hospital units approved for this place. Work is to begin immediately upon two of these units by the Engineer Corps.

Savenay: Base Hospital No. 8, with a capacity of 800 beds, which construction, now under way, will increase to 1,300 beds; will eventually be center for 5,000 beds, the work to be carried on by Engineer Corps. To become center for psychiatric clinic of 100 beds.

Souge: Camp Hospital No. 20, with a present capacity of 120 beds, which construction by Engineer Corps, now under way, will bring to 500 beds.

St. Maixent: Camp Hospital No. 30, with a capacity of 117 beds, which construction by Engineer Corps, under way, will increase to 300 beds.

St. Nazaire: Base Hospital No. 101, with a capacity of 890 beds, in operation. Camp Hospital No. 11, with a capacity of 350 beds, under construction by Engineer Corps. Receiving and forwarding medical supply base No. 1. Base medical laboratory, base section No. 1.

Toul: Five hundred beds in wing of French H. O. E. Justice (Field Hospital No. 12 to operate here); 400 beds in Sebastopol Barracks (Evacuation Hospital No. 1 to operate here); 400 beds at Menil-la-Tour, evacuation ambulance company to operate at railway station.

Tours: Camp Hospital No. 27, with a capacity of 300 beds, in operation in old French hospital.

Vauclaire: Base Hospital No. 25, with a capacity of 1,000 beds, to be located in French buildings leased for that purpose.

Vaucouleurs: Camp Hospital No. 5, with a capacity of 300 beds, vacated because of evacuation of training area.

Vichy: Base Hospital center for 3,500 beds, to be acquired by leasing French hotels.

Vittel: Base Hospitals 23 and 36, with a capacity of 1,750 beds each, in operation in hotels, leased for hospital purposes.

Cross reference

BASE HOSPITALS

[Receiving, or ready to receive, patients]

A. E. F. design- nation	Location				Eventual ordinary bed ca- pacity to be pro- vided
	Town	State	Region	Where organized	
6	Bordeaux.....	Gironde.....	18	Massachusetts General Hospital.....	1,860
8	Savenay.....	Loire Inferieure.....	11	New York Post-Graduate Hospital.....	2,500
9	Chateauroux.....	Indre.....	9	New York Hospital.....	1,500
15	Chaumont.....	Haute Marne.....	Z. A.	Roosevelt Hospital, New York.....	1,500
17	Dijon.....	Cote d'Or.....	8	Harper Hospital, Detroit.....	1,000
18	Bazailles.....	Vosges.....	Z. A.	Johns Hopkins, Baltimore.....	1,000
23	Vittel.....	do.....	Z. A.	Buffalo General Hospital.....	1,750
27	Angers.....	Maine et Loire.....	9	University of Pittsburgh Med.....	2,000
31	Contrexeville.....	Vosges.....	Z. A.	Youngstown Hospital.....	1,275
32	do.....	do.....	Z. A.	Indianapolis City Hospital.....	1,225
34	Nantes.....	Loire Inferieure.....	11	Philadelphia Episcopal Hospital.....	1,000
36	Vittel.....	Vosges.....	Z. A.	Detroit College of Medicine.....	1,750
39	Limoges.....	Haute Vienne.....	12	Massachusetts Homeopathic Hospital.....	350
66	Neufchateau.....	Vosges.....	Z. A.	United States at large.....	800
101	St. Nazaire.....	Loire Inferieure.....	11	American Expeditionary Forces at large.....	1,000
Naval	Brest.....	Finistere.....	11	United States at large.....	410

CAMP HOSPITALS

[Receiving, or ready to receive, patients]

A. E. F. design- nation	Location			Eventual ordinary bed ca- pacity to be pro- vided
	Town	State	Region	
1	Gondrecourt.....	Meuse.....	Z. A.	300
3	Bourmont.....	Haute Marne.....	Z. A.	300
12	Le Valdahon.....	Doubs.....	7	300
13	Mailly.....	Aube.....	Z. A.	300
14	Issoudun.....	Indre.....	9	300
15	Coetquidan.....	Ille et Vilaine.....	10	300
19	La Courtine.....	Creuse.....	12	300
20	Souge.....	Gironde.....	18	500
21	Bourbonne les Bains.....	Haute Marne.....	Z. A.	200
	Langres:			
22	Turrenne Barracks.....	do.....	Z. A.	120
23	Physic. Hospital.....	do.....	Z. A.	100
24	Comp. Hospital No. 3.....	do.....	Z. A.	300
	Blois:			
25	Comp. Hospital No. 13.....	Loire et Cher.....	5	130
26	Comp. Hospital No. 29.....	do.....	5	300
27	Tours, Comp. Hospital No. 3.....	Indre et Loire.....	9	300
28	Nevers, Comp. Hospital No. 14.....	Nievre.....	8	130
29	Le Courneau.....	Gironde.....	18	1,000
30	St. Maixent.....	Deux Serves.....	9	300
31	Meucon.....	Morbihan.....	11	500
32	Courcelles.....	Haute Marne.....	Z. A.	240
33	Brest.....	Finistere.....	11	1,000

Cross reference—Continued

CONSTRUCTION PROGRAM

Location of site			Number of units authorized ^a	How to be acquired	Eventual ordinary bed capacity to be provided as authorized ^b
Town	State	Region			
Base hospitals:					
Bazoilles.....	Vosges.....	Z. A.	6	New construction.....	6,000
Limoges.....	Haute Vienne.....	12	3	Two new construction, 1 remodeled seminary.....	4,000
Vauclaire.....	Dordogne.....	12	1	Completing existing building.....	1,000
Bordeaux.....	Gironde.....	18	5, ^a 15	New construction, French contract.....	{ 20,000
Rimaucourt.....	Haute Marne.....	Z. A.	2, ^a 3	New construction.....	{ 2,000
Langres.....	do.....	Z. A.	2, ^a 3	do.....	{ 5,000
Allerey.....	Saone et Loire.....	8	10	New construction, French contract.....	{ 2,000
Mesves.....	Nievre.....	8	10	do.....	{ 5,000
Beaune.....	Cote d'Or.....	8	10	New construction.....	10,000
Mars.....	Nievre.....	8	10	New construction, French contract.....	10,000
Nantes.....	Loire Inferieure.....	11	3	do.....	3,000
Savenay.....	do.....	11	1	New construction.....	2,500
Perigueux.....	Dordogne.....	12	5	New construction, French contract.....	5,000
Vichy.....	Allier.....	13	2	Leasing hotels from French.....	3,000
Camp hospitals:					
Humes.....	Haute Marne.....	Z. A.	1	New construction.....	300
Montigny.....	do.....	Z. A.	1	do.....	300
Chat. Villain.....	do.....	Z. A.	1	do.....	300
Prauthoy.....	do.....	Z. A.	1	do.....	300
St. Nazaire.....	Loire Inferieure.....	11	1	do.....	300

^a Additional contemplated.^b As contemplated by future addition.

MISCELLANEOUS MEDICAL DEPARTMENT ACTIVITIES

A. E. F. designation	Location		Remarks
	Town and State	Region	
AMERICAN RED CROSS MILITARY HOSPITALS			
1.....	Paris, Seine.....	C. R.	650 beds, formerly American ambulance. 300 beds. 50 beds; reserved for officers and Red Cross personnel.
2.....	do.....	C. R.	
3.....	do.....	D. R.	
EVACUATION HOSPITALS			
1.....	Toul, M. et Moselle.....	Z. A.	5
2.....	Bazoilles, Vosges.....	Z. A.	
3.....	Blois, Loire et Cher.....		
MEDICAL LABORATORIES			
1.....	Neufchateau, Vosges.....	Z. A.	8 11 18 11 9
Central.....	Dijon, Cote d'Or.....		
Base 1.....	St. Nazaire, Loire Inferieure.....		
Base 2.....	Bordeaux, Gironde.....		
Base 5.....	Brest, Finistere.....		
Intermediate.....	Chateauroux, Indre.....		
MEDICAL SUPPLY BASES AND DEPOTS			
1 advance.....	Is-sur-Tille, Cote d'Or.....	8	Supply depot. Do. Do.
2 intermediate.....	Gievres, Loir et Cher.....	9	
3 intermediate.....	Cosne, Nievre.....	8	
Base 1.....	St. Nazaire, Loire Inferieure.....	11	Receiving and forwarding bases. Do. Do.
Base 2.....	Bordeaux, Gironde.....	18	
Base 5.....	Brest, Finistere.....	11	

NOTE.—The following mobile sanitary units are automatically attached to each division of troops in the field: Four ambulance companies (3 motor and 1 horse-drawn); 4 field hospital companies (3 motor and 1 horse-drawn); 1 evacuation ambulance company (motor).

The following memorandum for the chief surgeon, A. E. F., from his deputy at general headquarters, A. E. F., gives a good perspective of the location of our hospitals necessitated by the acquisition of the fact that our principal sector of the front was to be from St. Mihiel eastward:

GENERAL HEADQUARTERS, AMERICAN EXPEDITIONARY FORCES,
France, August 9, 1918.

Memorandum for the chief surgeon (attention of hospitalization section):

1. Recent developments up here show that our principal sector is to be from St. Mihiel eastward. How far to the east we will go depends upon the number of troops available for holding the line.

2. The assistant chief of staff, G-4, has given instructions that all projects originally outlined for the development of railways, regulating stations, hospitals, etc., for the Toul sector are again in force. I asked the assistant chief of staff, G-4, particularly about Chatillon-sur-Seine. He approves of it as a hospital site; and if the chief surgeon's office desires, hospital construction can be gone ahead with at that place. A study of the railroad map will show how very well located this place is for our purpose. Moreover, this is the finest hospital site I have seen in France. If more hospital facilities are desired in the advance section, this is undoubtedly the place.

3. We have another approved site at Mirebeau, near Dijon, which as a site is not as desirable as Chatillon.

4. The assistant chief of staff, G-4, is very anxious that we should have hospital facilities along the different lines north and south controlled by the different regulating stations. This in order to prevent the cutting across in the rear of different armies with our hospital trains. This is the case at the present time when the regulating officer at Le Bourget sends a train down into the advance section. It can be done, as has been shown, but if railroad traffic is heavy it becomes practically impossible to cut across from west to east, or vice versa. The assistant chief of staff, G-4, thinks that we should plan our hospitalization in the future to permit of evacuation practically from any part of the entire line along the north and south lines. I was surprised to find that he included in this the English front. In this connection, I would like to suggest Evreux as a site for hospital development. I am inclosing a railroad map which my assistant has prepared from one furnished him by the French G. Q. G. This shows the lines of evacuation from each one of the French regulating stations, beginning on the west with Sotteville, then to Nantes, Creil, Le Bourget, Connantre, St. Dizier, Is-sur-Tille, and Gray. These regulating stations are also the stations which our troops will use. As far as we have gone, we have followed the regulating system from Is-sur-Tille as far as it was possible to do so and reach our ports. Everything that has been done in the way of locating hospitals will fit in there nicely with future developments along the lines indicated.

On August 17 the chief surgeon notified the chief of the French mission that the offer of the French for accommodation for 3,300 beds in various localities was accepted.⁴² In the Paris district, in addition to what was already organized, it was desired that facilities for 15,000 beds be provided, and that extensive hospitalization be provided at Vichy because of its accessibility by rail from the front, and the suitability of the buildings there.⁴²

On August 24, 1918, the chief surgeon reported as follows:

[Memorandum]

AUGUST 24, 1918.

From: Chief surgeon.

To: Assistant chief of staff, G-4, Services of Supply.

Subject: Hospitalization.

1. There are 75,000 beds at present in base hospitals; 50,000 are occupied. There are 1,400,000 troops in France, and 15 per cent of hospitalization would give 210,000 beds that should be available, making a shortage of 135,000 beds.

2. It is not believed that any construction should be eliminated from this program. The projects under construction as follows:

	Beds		Beds
Bazoilles.....	7, 000	Montoire.....	10, 000
Langres.....	2, 000	La Suze.....	5, 000
Allerey.....	10, 000	Avoine.....	5, 000
Beaune.....	10, 000	Savenay.....	20, 000
Mars.....	20, 000	Nantes.....	3, 000
Mesves.....	20, 000	Angers.....	2, 000
Tours.....	10, 000	Rochette.....	5, 000
Rimaucourt.....	5, 000	Périgueux.....	5, 000
Bordeaux.....	20, 000	England (by procurement and construction).....	20, 000
Limoges.....	4, 000		
Brest.....	3, 600		

Each to include its proportionate convalescent camp and crisis expansion.

3. It is believed that the following should be given priority for construction: Brest, Rimaucourt, Allerey, Mars, and Savenay.

By the end of August, 102,144 beds (including emergency beds) were provided, of which total 54,485 were occupied.²

The selection of sites, procurement of existing buildings, and construction of new ones progressed steadily, though scarcely keeping pace with the now rapidly increasing demand for beds, for large numbers of American troops were now engaged and battle casualties reached the hospitals in considerable numbers.²¹ One evacuation hospital (No. 7) received 27,000 patients between June 15 and August 11. Also a considerable amount of sickness had developed, including scattered outbreaks of influenza and quite general epidemics of diarrhea and dysentery. Further preparation of hospitals was necessary for the impending offensive, but no one could foresee that contemporaneously with this conflict there would occur a great influenza epidemic that would call for almost as many hospital beds as would the destructive efforts of the enemy.

During September 10, 150 beds were provided at Cannes, Nice, Menton, and other points on the Mediterranean and a lesser number at Biarritz, near the Pyrenees.²¹

The French submitted another long list of hotel buildings which might be used as hospitals, and a list of barracks and school buildings which were made available by their Government.⁴⁴ Of their last mentioned structures certain were accepted, to a total capacity of 11,550 beds. The director of construction and forestry, A. E. F., was notified of that fact, given the names and addresses of medical officers who would be concerned in the operations of the hospitals located in these public buildings, and requested that the Engineer Department consult with them in each case concerning the location of the building, repairs required, and any information desired in connection with their operation.

By the end of September, 1918, the total fixed hospital capacity, including emergency beds, was 148,596 beds. Of these, 79,580 were occupied. A hospital center providing 10,240 beds was being established in 25 hotels on the Riviera. A center had also been established at Clermont-Ferrand.

During October the French furnished a long list of buildings which could be turned over to the Americans for use as hospitals, the total providing accommodations for more than 30,000 beds.²¹ Most of these buildings were schools, barracks, hotels, chateaux or residences.

The demands for beds was increased to an unexpected degree at this time because of the epidemic of influenza which assumed grave proportions simultaneously with the prosecution of the Meuse-Argonne operation. American battle casualties during that action included 72,584 wounded and 23,934 gassed.²

This cumulative combination of circumstances subjected the hospitalization facilities to a severe test—not so much because of the number of beds necessary, as because of demands for equipment and especially for personnel.² The inadequacy of Medical Department personnel to meet the demands now made upon it, is discussed in another chapter of this volume.

In the procurement of existing buildings for hospital purposes full cooperation had been received from the French with the result that space for thousands of beds had been secured.²⁷ Though far from ideal for hospital purposes, these buildings at least afforded shelter. In spite of all that could be done, however, with the heavy fighting at the front and a serious influenza epidemic during the months of September and October, the margin of safety, consisting of unoccupied beds, steadily decreased. On October 10 there were more beds occupied than were shown by the normal bed capacity, and by October 17 the 166,200 beds occupied included 30,798 for emergency use.²⁷ The authorized program at this time provided for approximately 100,000 beds in addition to those already available. Careful consideration was directed toward the provision of 600,000 beds before July 1, 1919, and all needed aid in the carrying out of the program was promised.²⁷ On October 19, the commander in chief wrote to the commanding general, Services of Supply, as follows:

G. H. Q., A. E. F., 4TH SEC., G. S.,

October 19, 1918.

From: C. in C.

To: C. G., S. O. S.

Subject: Hospitalization program.

1. The situation of the American Expeditionary Forces, from the point of view of hospitalization, has become alarming. The small margin of safety which has existed heretofore has disappeared. The commander in chief is deeply interested in this matter, and has expressed his concern over the outlook. He directs that immediate steps be taken to remedy the critical situation with which we are now confronted, and that a hospitalization program, more comprehensive in scope and sufficient to provide for our future needs, be inaugurated with the least practicable delay.

2. In this connection, attention is invited to the indorsement from this office of June 1, 1918, a copy of which is herewith attached, which authorizes American Expeditionary Forces hospitalization requirements on the basis of 15 per cent of hospital beds for all American Expeditionary Forces troops in Europe. In this indorsement it was specifically stated that so-called "emergency expansion" was not to be included in computation of beds available. Based on the estimates as outlined in the indorsement referred to, an analysis of this date shows a deficit of approximately 100,000 beds therein prescribed, with apparently insufficient provision for the future. It would appear that a most unsatisfactory situation has been permitted to develop. It must be rectified at the earliest possible moment.

3. In a recent communication, the War Department commented upon the insufficiency of the American Expeditionary Forces hospitalization program. It is recognized that the War Department has been somewhat remiss in that it has failed to ship the necessary and authorized personnel and equipment for hospitals which are now available for occupancy. However, as a result of repeated cables and statements of the extreme seriousness of the existing situation, it is believed that the personnel and equipment phase of our present difficulties will soon be relieved. In any event, this is not a factor which should be taken into consideration at this time in providing hospitals on the scale which is necessary, if the needs of the future are to be met.

4. Accordingly, the commander in chief directs that this matter be given careful consideration, and that a hospitalization program aiming at the provision of 600,000 beds for the American Expeditionary Forces by July 1, 1919, be immediately inaugurated. As the possibilities of acquiring existing buildings or hospitals from the French have been practically exhausted, the greater part of this program will, of necessity, be possible of fulfillment only through the means of new construction, chiefly of the hut or portable barrack type.

5. In accomplishing this project, the skilled services of civilian contractors should be utilized to the maximum extent possible, and provision be made to furnish them as much additional labor and other assistance as may be necessary to expedite construction undertaken by this means. If necessary, every effort will be made to assign or procure for you such additional labor or construction troops as will be required to carry out this program.

6. The chief surgeon should make an immediate general survey and submit to you his recommendations as to where the hospitalization herein prescribed can most advantageously be established. As the changing military situation will probably frequently require the presence of our troops as far north as the channel ports, the need for new hospitalization north and west of Paris should be given careful consideration. The evacuation lines from the regulating station at Creil should be given careful consideration. As a beginning, the French have already consented to the establishment of an American Expeditionary Force hospital at Evereux, authority for which has already been transmitted to you.

7. If this headquarters can assist in any way toward furthering the accomplishment of this hospitalization program, your recommendations thereon are desired, and will be carefully considered.

8. A brief report by letter as to the progress made, particularly with reference to new construction undertaken to meet future needs, will be forwarded to these headquarters at the end of each month.

By order of the commander in chief.

GEO. VAN HORN MOSELEY,
Brigadier General, G. S., Assistant Chief of Staff, G-4.

In his reply the commanding general, Services of Supply, stated that the hospitalization program of the American Expeditionary Forces had always been under the most careful observation and that every effort possible had been put forth to carry it out successfully.²³ The reasons why this had not been actually accomplished were pointed out substantially as outlined above; i. e., difficulties incident to procurement of suitable sites and to effecting new construction. Following this correspondence, a telegram was issued by the chief of staff American Expeditionary Forces, to the commanding general, Services of Supply, as follows:

G. H. Q., A. E. F., 4th SEC. G. S., October 20, 1918.

COMMANDING GENERAL,

Services of Supply, American Expeditionary Forces:

Because of the critical situation produced by the heavy demands on hospitals, the commander in chief directs as follows: First, the completion of all buildings under construction for hospital purposes and the necessary alteration in buildings taken over by the Medical Department from the French must be expedited in every possible manner. Second, commanding officers of base hospitals and hospital centers are authorized to retain class B privates capable of assisting hospital personnel for temporary duty. The number of these men will be determined by the commanders mentioned above, but will be kept at the minimum necessary to permit hospitals to function under emergency conditions now prevailing. Commanding officers will be held responsible for not exceeding the number hereby authorized. Third, every effort must be made to move Medical Department personnel, units, and hospital equipment coming into ports, other equipment being shipped from depots to hospitals with least possible delay. When hospital units arrive at ports with equipment, trains should be made up and equipment shipped at once with unit.

McANDREW.

Official:

ROBT. C. DAVIS, *Adjutant General.*

On October 28 the bed status of the American Expeditionary Forces was as follows:

AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON,
October 28, 1918.

Memorandum for the A. C. of S., G-4, Hdqrs. S. O. S., A. E. F.:

1. In reply to your memorandum of October 26, 1918, file No. 010186, submit the following information:

(a) Number of beds installed in hospitals ready to receive patients:

Camp hospitals:	Beds
Occupied.....	17, 751
Vacant.....	7, 481
Total.....	<u>25, 232</u>

Base hospitals (includes normal and crisis expansion beds):

Occupied.....	142, 675
Vacant (the vacant beds in base hospitals are all emergency).....	50, 289
Total.....	<u>192, 964</u>

Convalescent camps:

Occupied.....	15, 995
Vacant.....	4, 927
Total.....	<u>20, 721</u>

Total beds in camp hospitals, base hospitals, and convalescent camps..... 238, 917

Total occupied beds in camp hospitals, base hospitals, and convalescent camps.... 176, 421

Total vacant beds in camp hospitals, base hospitals, and convalescent camps..... 62, 496

(b) Number of beds complete now in depots and shipped but not installed and not taken up on daily bed report, 47,500.

(c) Personnel in Europe not operating hospitals, one base hospital. This personnel can operate 1,500 beds.

(d) Number of beds complete expected from the United States, to include February, 1919, as shown on priority schedule, 250,000.

(e) Personnel expected from the United States to include January 31, 1919, as shown on the priority schedule, officers, 9, 324; nurses, 16,717; enlisted men, 100,748.

February shipment schedule not yet made up. Beds which this personnel can operate:

Normal beds in base hospitals.....	124, 000
Normal beds in camp hospitals.....	13, 500
Normal beds in convalescent camps.....	24, 800

Total normal beds..... 162, 300

Total normal beds..... 162, 300

Crisis expansion beds..... 62, 000

Total normal and crisis expansion beds..... 224, 300

For the chief surgeon:

J. D. GLENNAN,
Brigadier General, Medical Corps.

On October 31, of 221,421 beds in camp and base hospitals 163,767 were occupied.⁴⁵ A number of casualties were passing through field, mobile, and evacuation hospitals, and there were yet others—relatively very few—in allied and Red Cross hospitals.² In camp and base hospitals 35,045 normal beds were vacant, for a number of patients were occupying emergency beds.⁴⁵ But for

that fact 98.3 per cent of the 166,534 normal beds then provided would have been occupied by 163,767 patients then in these institutions. In addition to the 221,421 normal and emergency beds in camp and base hospitals, as noted above, there were in operation convalescent camps which provided 25,070 beds. Of these, 19,047 were occupied. The grand total of all vacant beds, normal and emergency and in hospitals and convalescent camps, was 88,807. On November 1 the total number on sick report amounted to 9.08 per cent of the American Expeditionary Forces, i. e., in round numbers, 180,000 patients.²¹

The number of vacant beds, normal and emergency, during August and September had been well above double the number of patients, but during October, when the number of patients nearly doubled, the factor of safety fell from 100 to 33 per cent.²³

Shortly before the armistice was signed 115,000 additional beds were authorized either in existing institutions or in new formations, and buildings for accommodations to shelter 103,000 of this number of beds were under construction.²³ Also French buildings were secured and structures authorized in connection therewith for a total of 73,000 other additional beds. Buildings for 31,000 of the latter number were under preparation. New convalescent camps were also being constructed and others enlarged, increasing their total capacity by 15,000 beds. The total of new beds thus contemplated was:²³

	Authorized	Under construction
New construction.....	115, 000	103, 000
In French buildings.....	73, 000	31, 000
Convalescent camps.....	15, 000	15, 000
Totals.....	203, 000	149, 000

Completion of these projects in addition to the 281,598 beds already provided would have given a bed capacity of 484,598. This would have been sufficient for 15 per cent sick and wounded of a force of 3,210,000 men. There were nearly 2,000,000 men in France at this time, and it was expected that this number would rapidly be increased so that the entire bed allowance authorized would be required by the spring of 1919.²³

This project was soon increased so that when the armistice was signed on November 11 the hospitalization program included construction projects and leased buildings which together with those already established would be capable of providing ultimately for 423,722 normal beds and for emergency beds in addition to these to a grand total of approximately 541,000. These were to be distributed as follows:²³

	Beds normal	Beds emergency (including normal)
Base hospitals.....	322, 376	437, 744
Camp hospitals.....	38, 686	40, 835
Convalescent camps.....	62, 660	62, 660
Totals.....	423, 722	541, 239

Among the large projects planned at this time were the following:²¹ In Paris, 20,000 beds; Lyons, 15,000 beds; the Riviera, 15,000; Pau and vicinity, 10,000; Clermont and vicinity, 10,000; Vichy, expansion to 30,000; Orleans, 5,000; Blois, 3,000. Smaller projects were to be provided at Poitiers, Bordeaux, Angouleme, Rouen, Moulins, Roanne, Caen, and Parthenay. These plans, however, were changed after the armistice so as to provide hospitalization for an army of 80 divisions, or about 400,000 men.²¹

On November 1 the number of patients on sick report numbered approximately 182,000—i. e., 9.08 per cent of the entire force—but a number of these were under treatment in field formations. The number of patients in fixed formations reported on November 7 totaled 31,813. They were then distributed as follows:⁴⁶

Recapitulation

	Bed situation								Per cent of beds occupied				Percentage on section	
	Occupied		Vacant		Normal		Emergency		Normal		Emergency			
	Base	Camp	Base	Camp	Base	Camp	Base	Camp	Base	Camp	Base	Camp	Normal	Emergency
Advance section	22,521	3,425	20,463	2,622	42,472	5,616	58,050	6,411	53.0	61.0	38.7	53.4	54.0	40.3
Intermediate section	69,802	6,226	5,198	2,360	52,624	7,527	98,993	7,709	132.6	82.7	70.6	70.6	126.4	71.2
District of Paris	11,683		677		8,306		12,498		140.6		81.2		140.6	81.2
Base section No. 1	17,992	1,591	2,169	998	16,717	2,589	22,677	2,629	107.6	61.7	79.3	60.5	101.4	77.4
Base section No. 2	22,663	1,747	415	1,420	16,283	3,167	26,641	3,126	139.2	55.2	84.7	55.9	125.5	82.0
Base section No. 3	6,906	1,200	197	220	6,350	1,420	7,137	1,420	108.7	84.5	96.7	84.5	104.3	94.7
Base section No. 4			473			480		480				1.4		1.4
Base section No. 5	2,202	1,780	942	3	3,144	1,450	3,280	1,450	70.0	122.7	67.1	122.7	88.7	84.2
Base section No. 6			1,000	113	1,000	300	1,000	300		62.3		62.3	14.4	14.4
Base section No. 7			373	64		413		463		90.3		80.6	90.3	80.6
Subtotal	153,776	16,529	31,534	7,800	157,379	22,482	230,756	23,508	97.7	73.5	66.5	70.3	94.7	66.9

Summary

	Bed situation				Per cent of beds occupied	
	Occupied	Vacant	Normal	Emergency	Normal	Emergency
Base hospitals.....	153,776	31,534	157,379	230,756	97.7	66.5
Camp hospitals.....	16,529	7,800	22,482	23,508	73.5	70.3
Grand total.....	170,305	39,334	179,861	254,264	94.7	66.9
Total beds including convalescent camps.....					281,598	
Total patients including convalescent camps.....					193,813	
Vacant beds.....					87,785	

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CHAPTER XVII

THE DIVISION OF HOSPITALIZATION (Continued)

MEDICAL DEPARTMENT TRANSPORTATION

HOSPITAL TRAINS

Hospital trains of the American Expeditionary Forces, being Medical Department organizations,¹ that department administered the personnel assigned to them and was responsible for the maintenance of train supplies and equipment.² As railway units, hospital trains were operated under the direction of the officer to whom they were assigned, and were repaired by the transportation service, A. E. F.²

Assignments of hospital trains were made by the fourth section, general staff, general headquarters, A. E. F., to regulating officers and to the troop movement bureau, headquarters, Services of Supply.²

An officer of the Medical Department was assigned to each regulating station as a part of the staff of the regulating officer and as a representative of the chief surgeon, A. E. F., to whom commanding officers of hospital trains assigned to that regulating station, were directly answerable in matters pertaining to Medical Department administration.² The medical assistant to the regulating officer was charged with the duty of seeing that trains were at all times ready to answer calls, and, to this end, that they were kept properly stocked and provisioned.

Briefly, evacuation of sick and wounded from the zone of the armies by means of hospital trains was effected by trains assigned to regulating officers. On the other hand, evacuation from hospitals in the rear of the zone of the armies was provided for by the troop movement bureau at headquarters, Services of Supply, in accordance with requests made upon the bureau for this purpose by the chief surgeon, A. E. F.²

Prior to the signing of the armistice, most of the hospital trains were assigned to the control of the chief surgeon's representative at general headquarters.³ The remainder, which were engaged in secondary evacuations—i. e., removal of patients from one base hospital to another in the Services of Supply—were under the immediate control of the transportation section of the hospitalization division, chief surgeon's office, A. E. F., except that certain of these secondary evacuations, the purpose of which was to clear base hospitals in the advance section, A. E. F., were conducted for a brief period by the regulating station at Is-sur-Tille.³

Since the operation of regulating stations, and primary evacuations from the zone of the armies are discussed in Volume VIII of this history, no further reference will be made to these subjects herein.

The transport and hospitalization of sick and wounded in the American Expeditionary Forces after they had left the zone of the armies, presented

difficulties which differed in many respects from those which had confronted the French Army during three and a half years of warfare, and also from those of the British whose system of evacuation was similar to that of French though modified by geographic conditions.³ The French and British systems involved no long lines of communication to home ports. France was hospitalized intensively in each of her military regions, so that her disabled could be distributed among the many military hospitals scattered throughout the country, and, when hospital bed space was lacking, in private homes.³ The shortness of the journey to England made it possible for British wounded to reach home bases rapidly and in large numbers.

The American Army, on the other hand, was compelled to hospitalize in France and in England almost all its sick and wounded, during the period of active warfare, since it was impracticable to return to the United States any except a relatively small number who were permanently disabled.³ To meet the needs imposed by this situation and to economize personnel and matériel, we had recourse to the use of large hospitals and hospital groups into which patients could be received by the trainload. These organizations necessarily were situated on supply lines of the American Expeditionary Forces. The plan involved long hauls when patients were moved from the front into hospital centers in the intermediate or base sections, and early in the organization of the American Expeditionary Forces it was appreciated that ample hospital train service was one of the prime elements of a successful evacuation service. The procurement of such trains was one of the first subjects taken up by the chief surgeon, A. E. F.³

PROCUREMENT

Pending later arrangements, two hospital trains were rented from the French Government, the order for them being placed in July, 1917,⁴ delivery for one being effected in December of that year and for the other in February, 1918.⁵ Since it was known the French could not furnish more trains, and as a tentative estimate had been made that 10 trains would be needed for every 500,000 troops, contracts for others were let in England.⁶ By August 12, 1917, arrangements had been completed for the procurement of 12 hospital trains from England and the 2 (above mentioned) from France. As the situation developed, an increasing number of these trains was contracted for to a total of 48 hospital trains and 20 corridor trains for sitting patients only.⁵ Fifteen of the former had been ordered prior to December 31, 1917, and by the end of August, 1918, 17 hospital trains were in use, and orders had been placed in England for 23 others.⁵ The order for the corridor trains was placed on November 7, 1918.⁵ Delivery of trains of both kinds was stopped when the armistice was signed.⁵ At that time 19 hospital trains had been received from the British and 4 more were ready for shipment.⁵ The cost of each train was approximately \$200,000.³ In addition to these trains others, not especially built for the conveyance of casualties but adapted as well as might be to that purpose, were rented from the French to meet emergencies.³

BRITISH-MADE AMERICAN HOSPITAL TRAINS

Each of the British-made trains consisted of 16 coaches. With a few minor exceptions they were standardized and afforded the following accommodations:⁷ 1 car for infectious cases, 24 beds (one end used for caboose); 1 staff car, 8 beds; 1 kitchen and sick officers' (sitting) car, 3 beds for cooks, 20 seats; 9 ordinary ward cars, 36 beds each; 1 pharmacy car, 12 beds; 1 personnel car, 33 beds; 1 train crew and store car, 3 beds; 1 kitchen, men's mess car, caboose, 2 beds for noncommissioned officers.

The average weight of an empty train, without engine, was about 450 tons, and the average length, less the engine, 920 feet.⁷ Long coaches, 54 to 56 feet from end to end, were used instead of the short, continental type, in order to insure more comfortable journeys. These trains were so attractive in appearance that they were frequently placed on exhibition in England before being shipped to the Continent.

Each train was provided with 360 beds for patients.⁷ Not infrequently, however, in emergencies, the train personnel gave their beds to patients, thus increasing train capacity to 396 beds. Fittings in all trains (except the one first rented from the French, which accommodated 306 recumbent patients) could be so adjusted by folding up the middle tier of beds that the relative number of recumbent and sitting patients could be varied from 120 of the former and 480 of the latter—the normal arrangement—to 360 of the former and no sitting patients. The crisis load was 120 beds and 488 sitting patients.⁶

Special provisions were made for the badly wounded, the slightly wounded, infectious and mental cases, respectively, including arrangements for their medical care and for supplying them with proper food.⁷ Special cooking facilities were afforded in the two kitchen cars which formed part of these trains.

The forward kitchen car was divided into three sections—kitchens, sitting room for disabled officers, and a bedroom for cooks.⁷ In the first section was installed an Army range with equipment, together with an apparatus providing an adequate supply of water for cooking purposes. This kitchen was used only when there were patients on board and was supplementary to the kitchen at the rear of the train. The latter served duty personnel, whether there were patients on board or not.

The staff car, for medical officers and nurses, was provided with sleeping compartments and a separate dining room for nurses and officers.⁷ Also it was equipped with a shower bath and was made as comfortable as possible.

Each of the 9 ordinary coaches for recumbent patients was fitted with 36 beds, arranged in tiers of 3. Beds were specially designed, were removable, and in case of necessity could be used as stretchers.⁷ When the car required cleaning these beds could be folded against the sides, and by lowering the middle one flush against the sides of the car the bed nearest the floor was converted into a comfortable seat or couch, the top one being still available for a recumbent patient. By thus converting beds into seats the less seriously wounded could sit up or lie down as desired.

These coaches were considered models of simplicity and efficiency.⁷ To expedite loading and unloading double doors were provided on each side of each ward coach, as near the center as possible. In cases of serious injury where it was not advisable to remove a patient from the litter, this could be rested directly on the bed supports, without complicated adjustments. Ash trays and small racks for holding patients' toilet and other personal articles were provided in convenient places.

The pharmacy car was placed near the center of the nine ward coaches. It was well equipped with drugs, linen, medical and surgical necessities, and had an office where records were kept. It also had a room containing a collapsible operating table for minor operations or for changing dressings, a 12-bed ward, and a morgue.⁷

The car for infectious cases was divided into four compartments for patients and one for attendants.⁷ Each compartment for patients (used also for mental cases, as required) accommodated six patients.

The personnel car, provided for the enlisted force, was designed on the same lines as an ordinary ward coach, so that in emergencies it could be utilized as a patients' car.⁷ Accommodation for patients was also increased at such times by the insertion of litters wherever these could be placed.

The second kitchen car had dining-room accommodations for noncommissioned officers and enlisted men and was equipped with facilities for cooking and for heating water similar to those installed in the forward kitchen car.⁷

The last coach on the train furnished ample storage space for general supplies such as food and drugs for seven days and, in a section partitioned off from the rest of the car, afforded additional accommodations for the train crew.⁷

Trains were electrically lighted throughout and were capable of generating current when running at any speed.⁷ Storage batteries were placed under the bodies of the cars to furnish current when the train was not in motion, but orders were enforced that current be economized. Hurricane oil lamps and an ample supply of candle holders were provided for emergency use in case the electrical connections became disordered. Material for gas lighting was supplied at some stations, but in times of battle pressure trains were not held to have this supply.⁷ If this material was refused at any of these stations, the fact was reported to the transportation section of the chief surgeon's office.

Our British-made hospital trains were steam heated throughout, the ratio of heat-radiating surface being higher in them than in any other railway coaches on the Continent.⁷ Staff and personnel coaches were provided with a special self-heating equipment for use when detached from the engine. As the personnel lived on board, this was a necessary provision. When trains carrying patients were garaged on sidings and their engines detached, the train commander was authorized to request French authorities or the railway transportation officer to have an engine attached if weather conditions were severe.

An ample supply of water for drinking and other purposes was provided on all coaches, the amount per train being about 2,500 gallons.⁷ Drinking water was supplied in 6-gallon tanks throughout the train, and it was ordered that these tanks be filled as opportunity offered, due notice being given the railway transportation officer, who was charged with making necessary arrange-

ments. All drinking water was sterilized. Water for washing trains was obtained from the station supply.

Special attention was given to ventilation of ward and other cars and of lavatories.⁷ Trains were equipped with large electric fans, and small portable ones were used in the treatment of gassed cases. Lavatory accommodations were ample.

TRAINS OBTAINED FROM THE FRENCH

The acute need for hospital trains arose first in May, 1918, at Cantigny, and was intensified during the operations in the Marne area.³ It continued throughout July and late into August in the last-mentioned sector and in that of the Champagne. A large number of American wounded were evacuated by trains procured from the French during operations in front of Paris in July and August, though we then had 9 trains, from Pantin, in service.³ From 4 to 6



FIG. 82.—Hospital train obtained from the French, at Base Hospital No. 9, Chateauroux

of these were sent daily to entraining points and were routed into Paris or through it to other destinations. Arrangements had also been made with the French to furnish us other hospital trains and trains for patients. In the same way 45 French trains were borrowed for use during the St. Mihiel and Meuse-Argonne operations.³ These were additional to the 2 specially prepared trains rented from the French in July and the 19 built in England.

French trains obtained for the Meuse-Argonne operation were of three main types:⁹ (1) Permanent trains made up of corridor cars. (2) Permanent sanitary trains made up of cars specially constructed for the transportation of bed patients. These were comparable to our hospital trains except that they were smaller, carrying 120 recumbent patients. Heating, as a rule, was central. Patients were unloaded through side doors. (3) Improvised hospital trains

made up of ordinary passenger cars fitted with racks for holding stretchers. Only recumbent patients were carried in these, 12 to a car. Cars were heated by a small stove in each, and there was no communication between them. One enlisted man of the French Medical Department traveled in each car.

In addition to these hospital trains there were the mixed or semipermanent types, made up of the ordinary French day coaches (second and third class) with lateral corridors. Certain of them were equipped for carrying recumbent cases.⁹ Some of these trains were made up of corridor cars only; others only partially so. Two stretchers, one above the other, were placed in one-half of each com-



FIG. 83.—French hospital train, with continental type of carriage

partment, leaving room for 3 sitting cases on the opposite seat; that is, each compartment carried 5 patients, 2 lying and 3 sitting. According to the number of compartments (6, 7, or 8), cars carried 12, 14, or 16 recumbent cases each, and 18, 21, or 24 seated; a total of 30, 35, or 40.

The method of supporting stretchers varied somewhat, according to the type of train and also whether it belonged to the Midi or Paris-Lyons-Mediterranean Co.⁹ In cars of both these lines the interior handle of the stretcher rested against an iron frame fixed to the side of the compartment. In the Paris-Lyons-Mediterranean type of train the external handle of the stretcher rested on the end of the same frame, while in the Midi type of train it was suspended by a chain from the roof of the car.

Carrying capacities of these French trains varied considerably.⁹ Some accommodated an average of 70 recumbent and 300 sitting patients; others from 70 to 280 recumbent and no sitting patients. Some carried 108 recumbent and from 230 to 250 sitting patients, and so on.

Toward the end of the Meuse-Argonne operation a few trains of large capacity, carrying from 1,000 to 1,500 were utilized for the exclusive use of sitting cases.⁹ It was thought that box-car trains would be used only during periods of intensive evacuation. In point of fact we employed them frequently during the Meuse-Argonne operation, because the whole front line from the sea to the Vosges was continually evacuating, and every available kind of transportation was needed.

Except the two trains obtained at first, those leased from the French were operated as arranged for by them, but their destination was controlled by the American Army.³ They were not used exclusively, however, for American wounded. French wounded carried on these trains were cared for and taken to American hospitals just as were American patients. Disabled German prisoners, too, were carried in the same way, no difference being made with them in accommodations, treatment, or disposition. During the St. Mihiel and Meuse-Argonne operations, approximately 2,000 wounded German prisoners were carried on trains belonging to the American evacuation service.³

It had been contemplated that box cars would be fitted up in such a way that they could be used for transporting patients from the front, and, by the readjustment of fittings, for transporting supplies from the rear.⁵ These fittings, consisting of metal posts supporting tiers of litters, could be screwed in to the floors and tops of cars and easily removed. Though these fittings arrived in France, they were never used, for while the idea appeared sound there was delay in cleaning trains and adjusting fittings. Moreover, cars were not always available when needed for this purpose. The French and the British Governments both had attempted to use the plan but soon abandoned it.

SUPPLIES

Initial supplies and equipment for hospital trains were procured from the American Expeditionary Forces medical supply depot, Cosne, upon which requisition was made direct.¹⁰ After being placed in operation these trains obtained their supplies from the hospital train store established at the central depot for hospital trains and from supplementary depots established as necessity arose. In times of pressure, hospital trains disembarking casualties at base hospitals where there were not hospital train depots, sometimes had to return direct to railhead areas without stopping for any prolonged period. Under such circumstances the commanding officers of these trains obtained supplies, if possible, from these base hospitals or from the quartermaster depots located there. Notice of stores drawn under such circumstances was sent to the central depot against which these supplies were charged, so that this depot could check the issue.

It was intended that property accountability should be taken care of by these depots and that hospital trains were to obtain their supplies from them on memorandum receipt, but until such depots were established it was neces-

sary for the trains to keep a property account.¹⁰ As soon as depots were established, orders were issued for hospital trains to invoice the property to depots but to retain the same on memorandum receipt. When emergency issues were necessary, a telegram was sent to the base hospital or quartermaster storehouse, giving train number, time of arrival, and name and quantity of articles wanted so that these would be available on arrival. When absolutely necessary for supplies to be drawn at the railhead, notice of what had been drawn was sent to the central depot for hospital trains.¹⁰

A list of the standard equipment for each train was furnished the regulating officer and was kept for his reference.⁷ He was authorized to check this equipment whenever he deemed this necessary, and the commanding officer of the train was ordered to check it frequently, verify its condition, and make suitable provision for its care. Hospital trains were supplied with adequate material to effect exchange of all property brought by patients from evacuation hospitals, such as pajamas, splints, crutches, litters, air pillows, and dakinization tubing; when such matériel was delivered with patients at base hospitals it was similarly replaced. Also, a sufficient supply of litters and blankets was kept at the hospital centers to permit an exchange, thus avoiding transfer of patients from one litter to another. When reserve supplies were not sufficient for the exchange of item for item, either the commanding officer or the supply officer of the train was given a receipt for matériel not replaced.

Red Cross comforts for patients were obtained at any train depot.³ Blankets were checked frequently, were obtained from depots when needed, and were disinfected at the central sterilizing plant.³ Reserve blankets were turned over to the railhead depot when required, and other medical supplies carried as reserve when asked for. When the train returned to a depot these reserve blankets and supplies were replaced. Similarly clothing and shoe repairs for personnel were obtained at the hospital train depots. Splints and suspension bars were carried in reserve to replace those brought with patients from the zone of the advance. Arrangements for dental service of train personnel were made at the depots.

PERSONNEL

Each American train carried, at first, a personnel of 3 medical officers, 3 nurses, 1 sergeant, first class, or hospital sergeant, 2 sergeants, 2 cooks, and 31 other enlisted men of the Medical Department, including 1 engineer-mechanic.³ Later it was found that two medical officers were sufficient, the third being replaced by an additional nurse. Train personnel was housed and fed on board whether in transit or in garage.³

ADMINISTRATION

The commanding officer of a train was charged with several correlated duties, exercising military jurisdiction and professional control.¹⁰ He was responsible for discipline, exercising control over personnel and patients, for which reason he appointed a summary court officer. He was also charged with the thorough instruction of his personnel. When patients were being entrained or detrained, the entire train personnel was on duty, and only the

officer in charge of the movement and the necessary enlisted help were allowed off the train.¹¹ Furloughs were granted only on approval of the regulating officer or of the transportation section of the chief surgeon's office if the train was under the latter's immediate control. Passes to leave a train were granted with discretion. No such passes were granted in the advance zone, and nurses were not permitted to be away from a train longer than two hours. Such of the train personnel as became incapacitated were left at the nearest base hospital. If anyone on duty missed his train he reported at once to the railway transportation officer of the station it, being forbidden to travel without orders on any train; all absences were reported to higher authorities. Ward orderlies were not sent out of the train for any purpose whatever. At night at least one medical officer, one trained nurse, and one orderly for each ward remained on duty. Precautions against fire were enjoined, and appropriate orders, including assignments in case of such emergency, were issued. The train commander permitted no one to travel on his train except its authorized personnel, men whose names appeared on the evacuation lists, and those authorized by the chief surgeon, A. E. F., or by the regulating officer to whom the train was assigned.^{10, 11} Armed guards who had accompanied such a train from the zone of the advance were forbidden to return on it except as so authorized.^{10, 11}

The train commander kept a war diary in which he made note of all matters of importance to its service.¹¹ He reported to the regulating officer or to the chief of the transportation section, chief surgeon's office, all cases of slight sickness and of the wounded who should have been retained in the advance area, and all cases of death, giving full particulars. (The regulating officer, in turn, transmitted this information to G-4, general headquarters, and to the Army surgeon.)¹² He supervised the treatment of patients and made provision for their care, kept up the records of sick and wounded, and sent to the chief surgeon A. E. F., to the commanding officer of the base hospital to which he was taking patients, and to the regulating officer, telegrams stating the number of recumbent and sitting patients in his total trainload, and the same information covering each class of patients on board: Wounded, sick, and gassed.¹¹ His telegram to the regulating officer, confirmed by mail, gave complete detailed information concerning the trip. To the chief surgeon, A. E. F., and to the regulating officer he sent copies of his train report and of his "detraining state." A telegraphic report of any accidents, confirmed by letter giving full particulars, was sent to the regulating officer, who was charged with the responsibility of sending immediate relief, with a wrecking crew, and with report of the facts in the case to the chief surgeon's office.^{11, 12}

Accidents causing damage to coaches, or derailments, were reported by telegraph to the transportation section, chief surgeon's office, A. E. F., and repeated to the Railway Transport Service, general headquarters.¹⁰ Demand for repairs, was handed to railway transport office representatives at bases where such repairs were possible and were authorized, but except in cases of great emergency no such demands were made at a railhead or other unauthorized station.

Suggestions concerning minor alterations in structure which appeared to be desirable, or notes on general conditions of trains, were sent by mail to the transportation section in the chief surgeon's office, A. E. F.¹¹

Trains were loaded as nearly as possible according to the instructions of the regulating officer and were routed as he directed, no trips being made except upon his authorization.² Upon completion of evacuation the train was sent back to the regulating area and garaged there.¹¹

If coaches were removed from or added to a train, notification with time, place, and cause, was telegraphed to the chief surgeon, A. E. F., or to the regulating officer concerned, who altered his record of the carrying capacity of such train and arranged his load for it accordingly.¹¹ Changes in the composition of hospital trains were authorized only by the chief surgeon. If the regulating officer found that conditions required such changes, he consulted the chief surgeon's office. If through accident or emergency cars were detached, the regulating officer endeavored to have them returned as soon as possible if in his area; if outside it, he made appropriate request upon the transportation section, chief surgeon's office. Use of cars except for their designated purposes was forbidden.¹¹

Careful classification of evacuable patients before loading was of vital importance, for the following reasons:¹¹ The rate of distribution among hospitals in the rear was proportionately as rapid as classification at loading points was correct. Retention of patients of the same classification in the same part of the train expedited their removal.

Evacuation officers of hospitals where patients were received gave especial attention to the classification of outgoing patients into such groups as "Seriously wounded," "Gassed," "Ordinary sick," "Infectious cases," "Mental cases."¹¹ The commanding officer of the train verified this grouping of cases according to classification. If several places were scheduled for detrainment, the patients were grouped according to their destination as far as this was possible.¹¹

The evacuation officer gave the train commanding officer his evacuation sheet, on which appeared nominal lists of all cases—classified—to be evacuated, and the latter prepared his train for the load.¹¹

When it was possible to do so the evacuation officer inspected each man as he was placed on board, noting the condition of clothing and dressings, the patient's field card, record of antitetanic injections given, and saw to it that no helmets, arms, or packets were carried. Only personal belongings were allowed to be retained by the patient.¹¹

The following reports were rendered for each journey:^{10, 11}

Detraining state: 2 (1 to detraining medical officer at destination; 1 to transportation section, chief surgeon's office, A. E. F.)

Report of train journey: 1 to transportation section, chief surgeon's office, A. E. F.

List of documents received: 1 to detraining medical officer at destination.

Nominal roll of officer patients: 2 (1 to detraining medical officer at destination; 1 to transportation section, chief surgeon's office, A. E. F.)

Death reports: 2 (1 to adjutant general's office, general headquarters; 1 to transportation section, chief surgeon's office, A. E. F.)

Nominal list of patients detrained en route: 1 to detraining medical officer at detraining station.

Telegram of French sick and wounded on train: 1 to commandant des Armees Francaises at destination.

Diet accounts: 1 to transportation division, chief surgeon's office, A. E. F.

War diary: 1 monthly to adjutant general's office, through transportation section, chief surgeon's office, A. E. F.

Return of journeys: 1 monthly to transportation section, chief surgeon's office, A. E. F.

A correspondence book was kept on each train, and a reserve supply of official labels in the office of each train, as follows:¹¹ (1) Casualty; (2) description; (3) patient's kit; (4) red labels (affixed to patients too sick to be transported farther and therefore put off at intermediate hospitals); (5) white or ship labels; (6) specification labels. These were supplied to trains as soon as obtainable by the depots.

The "detraining state" was a report given by the commanding officer of a hospital train to the detraining medical officer, and contained the following items:¹¹ (1) Train number; (2) army from which entrained; (3) time and place of departure; (4) destination; (5) gross number of patients on board; (6) numbers classified as "lying" and "sitting" in accordance with the following category: Infectious cases (disease to be specified); mental cases; Carrel cases; venereal cases; any other special cases; civilian patients (including Y. M. C. A. and Red Cross men); labor contingents; French, Belgian, Portuguese, etc.; German.

When patients were entrained at base hospitals for ports of evacuation, the entraining medical officer sent this information by telegram to the detraining medical officer of the port. When trains were loaded with patients for hospitals located at seaports and not intended for ships, the word "Hospital" was noted on the telegram to specify destination. Patients carried only between stations—as, for instance, for dental treatment—were not included in the telegram to detraining station, as this telegram was intended to notify base hospital authorities concerning the amount of bed space which would be needed for patients then en route.^{10 11}

The commanding officer of the train and the evacuation officer checked the loading of patients and verified the number evacuated.¹¹ When loading was completed the commanding officer of the train advised the railway transportation officer, who furnished him with an order of transport, showing destination, stops and load. The commanding officer advised the former of his readiness to leave, and verified the transmission of his several telegrams.

It was important that advance notice be sent of the expected arrival of a train, so that the receiving officer could arrange for prompt unloading and for sufficient transportation for the removal of sick and wounded to hospitals.¹¹ In order to expedite matters, announcement of prospective arrival of the train was made to the commanding officer of the receiving hospital by telegram from the regulating officer. It was also made by telegram from the commanding officer of a train as soon as loading was completed.

As promptly as possible after a train was loaded its commanding officer made inspection, again examining field cards and clinical records, verifying information regarding the administration of antitetanic serum and, when necessary, ordering it to be given.¹¹ He instructed ward car orderlies how to care for patients, and the orderlies prepared for him a list of the patients in their care. These lists formed the basis of the commanding officer's reports and of his telegrams to the chief surgeon and to the regulating officer making final records for the train trip.

In so far as the British-built American hospital trains were concerned the following scheme was adopted for a balanced load when it was desired to carry

600 or more patients:¹¹ Top berths were used for litter cases, the middle berths being folded, and lower berths for sitting patients, so that each car provided accommodations for 12 recumbent and 48 sitting patients. Serious cases requiring much attention were placed in the pharmacy car in order that their wounds might be redressed if necessary or the patients be otherwise cared for on the operating table installed in this car. Unless it was necessary to do so, wounded men were not removed from one car to another or from one litter to another. In times of stress the capacity of ward cars was increased by placing litters, in tiers of three each, across the car doors. These were secured by hooks attached to the end rods of the bunks, and by straps.



FIG. 84.—Interior of one of our hospital trains (British built)

Bodies of patients who died en route were left at the larger stations where stops were made, and full details regarding each body were given in an envelope to the officer taking charge of it, with notice that the commanding officer of the train had signed the official telegram notifying the central records office, A. E. F., of the patient's death.^{10 11} Personal effects of such casualties were disposed of in accordance with Army Regulations. The transportation section of the chief surgeon's office, A. E. F., was notified by letter of all deaths occurring on trains, with full particulars, and a telegram was sent thereto at the same time as that sent to the adjutant general's office, A. E. F. Very serious cases were sometimes detrained en route, at the larger places, but only when this was absolutely necessary.¹¹

PROFESSIONAL ACTIVITIES

Serious cases were cared for at once. Orthopedic cases and those that would require dressing en route, if not placed in the pharmacy car, were placed in the middle and lower bunks, with injured parts next the aisle.¹¹ Slightly wounded, recumbent patients were put in top berths and injured parts immobilized before the train started.¹¹ Mental cases were searched before being placed on board (all patients were disarmed before being entrained) and were taken to a separate compartment the windows and doors of which were closed, ventilation being provided by electric fans and roof ventilators. These patients were kept under constant surveillance. Contagious cases also were carried in special compartments.

Chest cases bore transportation badly. Empyema cases usually drained freely. When there was danger of secondary hemorrhage, new amputations were dressed while a stop was being made. A few operations, including ligations of arteries, were performed on trains, but professional activity was limited usually to redressings—generally performed in the pharmacy car—and symptomatic treatment.¹¹ Conditions causing the greatest concern were injuries of head and abdomen, and pneumonia cases. Cases of the first two classes were prone to secondary hemorrhage; pneumonia patients did not endure well any movement before convalescents. Gassed cases were carried recumbent when this was possible, and they were not allowed to smoke. If their eyes were injured and sensitive to the light, they were placed on the lowest berths if these were not needed for seriously wounded patients. If a patient's splint was so adjusted that it obstructed the car aisle, he was placed at the end farthest from the toilet and a chair put under his splint to remind passers to make a detour around him. Headboards of berths, especially on train No. 55, were placed at the end farthest from the car door, and patients were entrained head first and placed in berths without being turned around.¹³ This arrangement facilitated supervision by the ward master stationed at the center of the car. Upon completion of loading, this attendant examined all his patients and their medical cards, making appropriate entries in a notebook, noting the need of Carrel-Dakin solution, the administration or nonadministration of tetanus antitoxin and morphia, the presence of contagious or venereal diseases, abdominal wounds necessitating liquid diet only, and other items of professional importance.

SUBSISTENCE

Hospital trains drew rations and supplies at base hospitals if this plan was found to be more convenient.¹¹ Drawing of commuted rations was found difficult. Sales commissaries in advance zones were not in convenient locations for the 30 or 40 stations at which trains were garaged, and even when available they had not sufficient stock on hand to supply organizations in addition to those to which they had been assigned.¹¹ Nor were these sales commissaries open at all hours of the day and night.

French hospital trains in American service were furnished with rations by railhead officers upon request of the evacuation officer.¹² Patients on these French trains were fed at station infirmaries at regular feeding points and stops were arranged for in the schedule.¹²

MESSING OF PATIENTS ON REGULAR HOSPITAL TRAINS

Immediately upon entrainment patients were given hot drinks, soups, or other light nourishment. As the patients were to be on board only a relatively short time, meals were standardized on a number of trains—e. g., train No. 53, with the result that waste was minimized, the accumulation of unsuitable food prevented.¹¹

On train No. 58 patients were served a thick soup containing ingredients that otherwise would have been served as separate dishes—such as beef, potatoes, beans, hominy, and the like—and were given sandwiches.¹⁴ This method expedited service and facilitated the feeding of bed patients and at the same time conserved stove space needed for special diets. On other trains—e. g., No. 59—patients received the garrison ration, except that special cases were given light, soft, or liquid diets.¹⁵

MESSING OF PATIENTS ON EXTEMPORIZED HOSPITAL TRAINS

As previously stated, patients on most of the trains rented from the French were fed by station infirmaries while en route, at regular subsistence points, and stops were arranged for in the schedule.¹² When there was intercommunication between ward cars these stops were unnecessary. Certain of these trains were equipped with kitchen cars where patient's meals were prepared en route and served at certain stops specified in the schedule, and these trains were rationed accordingly. All French trains which the United States employed were rationed at railheads by local evacuation officers.¹²

DETRAINING PATIENTS

Each of our large hospitals or hospital groups had a railway transportation officer, one of whose duties was the arrangement of priorities for the stopping of hospital trains at proper detraining points.³ At each such detraining point detraining parties were organized, charged with the proper unloading of trains and with the duty of assisting train crews in the work of cleaning and disinfecting the cars, as well as in the proper exchange of blankets, litters and other supplies which might be unloaded with patients. This exchange was made through the train commander.

On arrival at a base hospital the commanding officer of a train had in readiness his "detraining state," which he turned over to the detraining officer of the hospital, together with all documents pertaining to patients, including any X-ray plates.¹¹ These were duly receipted for. The detraining medical officer informed the train commander of the order in which his patients were to be removed; whereupon an officer of the train supervised the unloading, taking care that patients' kits went with them. Officer patients' baggage was turned over to a noncommissioned officer detailed by the detraining medical officer to receive and receipt for it. Any articles whose ownership could not be traced were turned over to the central hospital train depot, with full particulars regarding them.¹¹

The train commander informed the railway transport officer of any gas, repairs, or water required and also gave the time when his trains would be ready to proceed.¹¹ Unnecessary delays were carefully avoided, as even a few minutes' delay might mean the loss of a schedule, resulting often in a halt of three or four hours before a new schedule could be obtained.

SANITARY SUPERVISION OF TRAINS

The sanitary condition of these trains required constant supervision, as patients were often received at the front with badly soiled clothing.³ Many of them harbored vermin, and many suffered from infectious diseases. One of the greatest difficulties experienced in train service was the provision of any adequate supply of water under sufficient pressure for flushing out all cars, though trains carried many lengths of garden hose to make distant water connections.³ The French offered the use of their disinfecting apparatus employed on their own trains, but their process did not utilize the methods and agents which American authorities preferred.³ It was the American practice to flush out trains from end to end as they returned to the front, walls being washed with formaldehyde solution and floors scrubbed with



FIG. 85.—Hospital train at Base Hospital No. 27, Angers

strong cresol. Blankets were shaken, mattresses turned, and latrine buckets cleansed and deodorized with chloride of lime. French trains placed at the disposal of the American Army invariably had been disinfected with formaldehyde, though this measure consumed time which the American service employed in returning trains to the front.³ One reason for our method was the shortage of trains. When ours were held in garages or on sidings for any length of time, galvanized-iron cans were placed under all waste and toilet discharges and were emptied by train personnel into proper places before the train started. This was always a troublesome process, especially in large freight yards such as at Pantin, near Paris, where many trains of all kinds were placed on tracks so close together that passage between them with these iron cans was almost impossible.³

LAUNDRY

Laundry was exchanged either at replenishment depots, including that of the regulating station, or at hospitals to which patients were taken.¹¹

TRAIN MOVEMENTS

As stated above, train movements were determined by the Railway Transport Service, which made the necessary traffic arrangements.⁷ American trains were not allotted to any particular line but were interchangeable and were operated according to Medical Department needs and traffic facilities.

Immediately upon requisition of the first train, arrangements were made for garage points and for routing and rates of speed on French railways.³ Through areas in advance of regulating stations it was never possible to route hospital trains any faster than freight.³ This corresponded to the slow freight train of America, but the disadvantage was not so great as might be supposed, the distance between entraining points and regulating stations usually being short. In routing trains from the latter stations, however, to points far in the interior, and even to base ports, the transportation of patients at such low speed was inadvisable, though the French used it for their hospital trains.³

Our need for a faster schedule arose from the fact that hospital trains had to travel long distances to reach our base hospitals.³ After several conferences on this subject, held in Paris with the fourth French bureau, the French Government gave orders to the French director general of transportation that American hospital trains traveling from regulating stations toward the interior be given the advantage of passenger-train schedules.³ In point of fact the speed was that of military trains, but on lines in the interior a faster schedule was followed whenever technical conditions permitted. In cases of emergency trains were dispatched on fast schedules for the entire journey, provided this did not interfere with the schedule of military trains having priority. All express schedules were authorized by the fourth bureau, general staff, which arranged the intercommunicating schedules with the railway management. These authorizations for rapid movement were transmitted immediately to the regulating officers concerned, showing the advanced notice required for dispatching trains and the proper railway authorities to be notified in each case.¹¹

Constant liaison was necessary between the regulating officer and train commanders, as the former could usually give the latter information concerning the approximate time of the next trip.¹² Especially was this true when trains were in one garage and where train trips followed consecutively; that is, where the last train in was also the last train to go out. Trains were often moved up to the loading points as trains already loaded pulled out. In such cases it was difficult to determine the time of movement. It was important, therefore, under such circumstances that trains always be fully prepared to be called on to move at a moment's notice.

Trains were routed so as to reach their destinations in the shortest possible time.^{11 12} They did not make stops en route even on sidings, if this could be avoided, and only after previous consultations with the railway authorities,

if this was possible. Long stops at railway stations were permitted only where tracks allowed loading or unloading without blocking the main line. Trains were ordered not to halt on main lines for more than the briefest possible time. At small stations unloading had to be done within a specified time, and so far as possible these places were avoided. Trains were split only in case of absolute necessity.

Night service was not often organized on branch lines, and notice had to be given in advance when trains were due to arrive at night.¹²

The regulating officer selected new loading stations in the army zone at points most convenient to the evacuation centers designated by the army surgeon.¹²

When a hospital train garaged at a regulating station was asked for by the army, the regulating officer proceeded to route the empty train, fully equipped, to an entraining point farther toward the front, where sick and wounded were received from evacuation or mobile hospitals.³ The regulating station then routed the train back, generally through the regulating station and then farther on into the interior to base hospitals in the advance, intermediate, or base sections designated to receive the patients.

The train made this journey under more difficulties than are at first apparent.³ In all forward areas, railways were constantly congested by traffic, and all rolling stock was routed on a priority schedule from which no deviation could be made without causing great confusion. For example, bread trains, passing forward daily through the regulating station, had priority over everything except moving troops, and empty hospital trains going forward from regulating stations had to take their chances for priority with all other railway transportation loaded with army necessities. If one train at an entraining point fell behind its schedule for starting on the return journey this might for the next 24 hours throw out the schedules of other trains carrying all kinds of supplies, for after loading, the hospital train proceeded back toward the regulating station and it became one of a stream of empty trains passing to supply bases over the same route. After arrival at the regulating station, another schedule had to be arranged for it by the regulating officer to get it through to its destination or detraining point in the interior. Little outside assistance could be given train commanders along this entire route, for which reason full equipment had to be issued before the train could begin its journey. In addition to this, excess equipment, rations, and supplies had to be carried, to provide for the numerous emergencies and delays which might occur before it could reach its destination.

PROVISIONS FOR REPAIRS

It early became apparent that provision must be made for minor repairs first, and major repairs later, which could not be made by the mechanic on duty with each train unit; consequently, immediately upon acquisition of the first trains, arrangements were made with the French fourth bureau for garage and repair at the American car shops at Nevers.³ Necessary repairs always began within an hour after the arrival of hospital trains at the shops, whether by day

or by night. Facilities were also provided at regulating stations in the army zone for garage of hospital trains, minor repairs, reception of water, rations, medical supplies, and the distribution of mail.^{3, 12}

SECONDARY EVACUATIONS

For secondary evacuations the 2 trains constructed by and leased from the French at the outset of our activities and the 19 trains built by the British were those chiefly employed, for they were in effect rolling hospitals, self-sustaining, and much better equipped for the care of patients during long hauls than were the smaller trains rented from the French.³ The latter were therefore used for primary evacuations.¹⁶ Secondary evacuation effected by the chief surgeon's office pertained chiefly to the movement of patients from base hospitals to ports of embarkation and the collection of certain types of cases—e. g., maxillofacial—at hospitals designated for their special treatment. Patients sent to ports of embarkation where those whom disability boards in the various hospitals had reported unfit for further military service in France (class D) and those who would require at least six months' hospital treatment before they could become members of class A; that is, fit for any military duty. Because of their serious wounds or their chronic illness, these class D patients required the most careful attention during transport, and, being widely scattered throughout France, their systematic collection and treatment en route presented a very serious problem to the transportation service. While many such patients made the necessary journey on ordinary passenger trains to hospitals at base ports, whence they were to be transferred to the United States, most of these were collected on hospital trains so routed as to impose the least hardship through unnecessary handling and delay in transit. The success of this secondary evacuation depended largely upon the cars used by disability boards at hospitals in the advance and intermediate sections in selecting such cases as were plainly able to bear both the journey on hospital trains and the subsequent transfer to ships at the base ports. If cases were selected at base hospitals for transfer to the United States which upon arrival at base ports were found unable to continue the journey to the United States, they had to be retained at port hospitals until such time as their condition warranted their embarkation and the long sea voyage. If such retention was protracted, there was danger of overcrowding hospitals at base ports.³

Prior to the armistice the collection of class D patients (i. e., those to be returned to the United States) for evacuation to the ports was a difficult problem, for these were cases of chronic illness or mutilating wounds, many of which required great care while in transit.³

As already stated, certain of these cases which were not in need of extraordinary care made the journey to base port hospitals by ordinary passenger train.³ Among such categories were cases of incipient tuberculosis and mental defectives of certain types; also some of those suffering from healing wounds or other injuries of the upper extremities could properly be sent in small parties accompanied by the necessary attendants. Larger groups of such cases were sent in special coaches furnished by the local railway transportation officer at hospital entraining points. Very often this method imposed hardship on certain types of cases sent, for many times it happened that changes of cars not anticipated by the

railway transportation officer were ordered by the French en route, accommodations sometimes being substituted which were inferior to the standard which the American service strove to maintain. But, whenever possible, patients were carried to the ports on hospital trains, for on the whole the system described above did not work well. It was resorted to only when hospital trains could not be spared for the purpose and hospitals had to be emptied to make room for fresh increments of the sick and wounded.

The movement of insane patients and mental defectives, including psychoneurotics popularly known as "shell-shocked," was always attended by difficulty and embarrassment.³ The laws of France prohibited the transport on French trains of men declared insane, but as a matter of fact this regulation



FIG. 86.—Entraining class D patients at Base Hospital No. 30, Royat

was sometimes disregarded, for mental cases developed in regular, small increments, making it impracticable to hold these patients for the accumulation at hospitals of a sufficient number to warrant the routing of hospital trains to collect them.³ Unless mental cases needed the closest supervision, or unless they were such as to excite comment en route, many of these were sent, accompanied by proper attendants, on ordinary passenger trains as "observation cases."³ We never had cause to regret dispatching these cases in this manner, since they were chosen carefully for this method of transportation, and the procedure prevented the accumulation of mental cases at hospitals which could not maintain specially trained personnel for their care, observation, and classification.³

When occasion demanded, hospital trains made periodic visits to collecting points such as the hospital center at Bazoilles on call of the psychiatric service to transport cases accumulating there.³ Some complaints arose from various causes concerning the transportation of mental cases, but these were invariably investigated by the evacuation service of the chief surgeon's office and no instances were found in which such patients were subjected to conditions which jeopardized their safety or ultimate recovery.³

Similarly, difficulties confronted the assembling of maxillofacial cases at Vichy, where special apparatus and personnel were provided to care for them.³ These cases were received at base hospitals all over France, but their number never warranted the use of hospital trains for their collection at one point.³ Though it is true that many of these cases were ambulant and were able to make journeys on ordinary passenger trains, the French were very insistent that mutilated patients be not routed on such trains, where the sensibilities of the traveling public would be distressed.³ Aside from this issue, it was very difficult for attendants to feed such cases en route from one hospital to another. Transport of selected cases to the maxillofacial center at Vichy was therefore a matter of exceptional difficulty, for their wide dispersion in hospitals throughout France, and the paucity of cases in a given hospital did not warrant the frequent use of a hospital train for their collection and conveyance.³ To a degree the same difficulty applied to the assembly and evacuation of the blind.³

After the beginning of the armistice, and after battle casualties had been cleared from field units, most of the hospital trains were engaged in evacuations from hospitals in the advance or intermediate section to others near base parts, but a few continued to serve the Third Army, making primary evacuations from the area of occupation, until arrangements were made for shipment of casualties down the Rhine.³

SUITABILITY OF HOSPITAL TRAINS

During our active military operations of 1918 American hospital trains proved excellently suited to our needs, except as noted below.³ When once a patient was started on the journey on one of these trains, food, warmth, and necessary treatment en route were assured. Patients sent on trains rented from the French (other than the two first obtained) were not so conveniently served, for these trains had limited kitchen facilities, or none at all, and routes taken to American base hospitals were not provided with the rest and refreshment stations found all along French evacuation lines. The American Expeditionary Forces had no personnel for the operation of such stations. This was one reason why French trains were used preferably for short hauls from the front hospitals in the advance section and American trains on longer trips to hospitals farther to the rear. Though excellent in other respects, American trains were so long and so heavy that French railway officials found difficulty in laying them on sidings and in providing space for them at garages and entraining points. In about 50 per cent of instances where trains were placed on sidings it became necessary to divide them into two or sometimes even three sections. In cold weather this was a great disadvantage, for the reason that it disconnected part of a train from its circulating steam line.

AMBULANCES

Ambulances comprised two kinds of vehicles: Animal-drawn and motor. The Medical Department made use of both kinds of ambulances for the transportation of patients in the American Expeditionary Forces; transportation of patients was a responsibility with which that department was charged throughout.

PROCUREMENT

In the American Expeditionary Forces, the use of animal-drawn ambulances was very restricted. These ambulances were assigned only to Medical Department units serving with combat troops; that is, one ambulance company of each divisional ambulance section was animal-drawn.¹⁷ Both animal-drawn ambulances and animals for them were supplied by the Quartermaster Corps; ¹⁷ their procurement was not a responsibility of the Medical Department.

The procurement of motor ambulances, on the other hand, was a direct responsibility of the Medical Department for the greater part of the war.⁵ In discussing this question it must be considered from both sides of the Atlantic, motor ambulances, though classed as Medical Department matériel when we entered the World War, became Motor Transport Corps matériel some months prior to the armistice. Since this change was effected considerably earlier in the American Expeditionary Forces than it was in the United States, there was a period when, as will be explained, the Medical Department in the United States was purchasing motor ambulances and shipping them abroad on Motor Transport Corps tonnage.

In December, 1917, what was then the Motor Transportation Service was created a part of the American Expeditionary Forces.¹⁸ Its purpose, in part, was the technical supervision of all motor-drawn vehicles; their reception, organization, and assignment (except vehicles belonging to organized units); and the organization and operation of repair and supply depots for motor vehicles. Until May, 1918, motor ambulances in the American Expeditionary Forces were not included in the classes of vehicles controlled by the Motor Transport Service, A. E. F.;¹⁹ however, they were maintained in a state of repair by that service. From May, however, all motor ambulances arriving in the American Expeditionary Forces were turned over to what had now become the Motor Transport Corps, A. E. F., but being classed as special vehicles, motor ambulances were held by that corps subject to the orders of the chief surgeon, A. E. F.¹⁹ Between this time and the following August, though the Medical Department procured motor ambulances in the United States, they were shipped overseas on Motor Transport Corps tonnage.²⁰ Subsequent to August, when the Motor Transport Corps, in the United States, took over the procurement of motor ambulances from the Medical Department,²¹ their shipment overseas became a responsibility of the Motor Transport Corps. Thereafter shipments were based on estimates furnished by the Medical Department, A. E. F.

ESTIMATES AS TO NUMBER

On September 22, 1917, the following memorandum was submitted by the chief surgeon, A. E. F., to the chief of staff:

1. The following motor vehicles of all classes will be needed by the Medical Department to meet the demands of the forces which it is estimated will be here on July 1, 1918: Motor ambulances, 1,446; motor trucks, 905; motor cars, 338; motor cycles, 557.

2. The motor vehicles should arrive per month as follows, based upon the contemplated program of the arrival of troops:

	Motor ambulances	Motor trucks	Motor cars	Motor cycles
October.....	145	91	34	56
November.....	145	91	34	56
December.....	73	46	17	28
January.....	290	181	68	112
February.....	145	91	34	56
March.....	73	46	17	28
April.....	217	136	51	84
May.....	217	136	51	84
June.....	141	87	32	53
Total.....	1,446	905	338	557

On November 27, 1917, the following more explicit estimate of the needs of the Medical Department in motor transport was submitted:²³

Re reply to memorandum from chief of staff, dated September 18, 1917 (corrected to November 27, 1917).

The following motor vehicles of all classes will be needed by the Medical Department to meet the needs of the forces which are estimated will be here by the 1st of July, 1918:

1. For the Army:

(a) Chief surgeon's office—

Motor cars.....	2
Motor cycles.....	2

(b) Central laboratory.

(c) Army laboratories (3 laboratories), each laboratory—

Motor car.....	1
Motor cycle.....	1
Motor truck.....	1

(d) One sanitary train (combat division)—

Motor cars.....	7
Motor cycles.....	17
Motor ambulances.....	36
Motor trucks.....	42

Total for the Army—

Motor cars.....	14
Motor cycles.....	24
Motor ambulances.....	38
Motor trucks.....	48
Special bacteriological cars.....	6

2. For each corps (5 corps):

(a) Office of each corps surgeon—

Motor cars.....	2
Motor cycles.....	2

(b) Corps laboratories, each—

Motor car.....	1
Motor cycle.....	1

Total for 5 corps—

Motor cars.....	15
Motor cycles.....	15

3. For each division (30 divisions, including 10 replacement divisions):

(a) Each division surgeon's office—

Motor car.....	1
Motor cycle.....	1

(b) Division laboratories (1 each)—Motor cycle..... 1

(c) Evacuation hospitals (2 per division)—

Motor car.....	1
Motor cycle.....	1
Motor trucks.....	3

(d) Evacuation ambulance companies (1 per division)—

Motor car.....	1
Motor cycle.....	1
Motor ambulances.....	20
Motor trucks.....	2

(e) Motor ambulance companies and field hospitals (3 per division)—

Motor cars.....	7
Motor cycles.....	17
Motor ambulances.....	36
Motor trucks.....	42

Total for the divisions (30)—

Motor cars.....	330
Motor cycles.....	660
Motor ambulances.....	1, 680
Motor trucks.....	1, 500

4. Line of communications:

(a) Chief surgeon's office—

Motor cars.....	2
Motor cycles.....	2

(d) Surgeons at base ports (3 bases)—

Motor cars.....	3
Motor cycles.....	3

(e) Base port transportation (3 bases; 1 motor ambulance company at each base)—

Motor cars.....	3
Motor cycles.....	9
Motor ambulances.....	36
Motor trucks.....	9

(f) Medical supply depot (2 at ports, 1 in intermediate section, 3 in advance section; total, 6 depots), for each depot—

Motor cycle.....	1
Motor trucks.....	2
Motor car.....	1

(g) Base hospitals; to July 1, 1918, 130 will be needed and each hospital must have—

Motor car.....	1
Motor cycle.....	1
Motor ambulances.....	3
Motor trucks.....	3

Total for line of communications (exclusive of 10 replacement divisions)—

Motor cars.....	148
Motor cycles.....	182
Motor ambulances.....	426
Motor trucks.....	411
Special bacteriological cars.....	4

* * * * *

Grand total:

Motor cars.....	507
Motor cycles.....	881
Motor ambulances.....	2, 144
Motor trucks.....	1, 959
Special bacteriological cars.....	10

Before December, 1917, there had already developed an acute shortage of ambulances, and shipments from the United States, because of procurement and tonnage difficulties, were under our estimated need.⁵ Although cable after cable was dispatched setting forth our emergency needs along this line, the shortage continued to increase. The problem of estimating our requirements was made more difficult by the lack of tables of organization in Services of Supply, corps, and army units;⁵ existing tables indicated transportation for divisions only. By April 24, 1918, the following further-developed estimate, concerning the motor transportation required by the various elements of the Medical Department, A. E. F., was formulated:²³

1. For the Army:

(a) Chief surgeon's office—	
Motor cars	2
Motor cycles (side cars)	2
(b) Central laboratory (1 laboratory)—	
Motor cars	2
Motor cycles (side cars)	4
Motor ambulances	2
Motor trucks	3
Special bacteriological cars	6
(c) Army laboratories (3 laboratories), each laboratory—	
Motor car	1
Motor cycles (side cars)	3
Motor truck	1
(d) One sanitary train (combat division) complete motor equipment—	
Motor cars	10
Motor cycles (side cars)	22
Motor ambulances	48
Motor trucks	53
Trailmobiles, kitchen, and water carts	16
Repair trucks	4
(e) Dental service—special dental cars	2
(f) Evacuation ambulance companies (1 per division)—	
Motor car	1
Motor cycle (side car)	1
Motor ambulances	20
Motor trucks	2
(g) Evacuation hospitals (2 per division), each hospital—	
Motor car	1
Motor cycle (side car)	1
Motor trucks	3
(h) Mobile hospitals (20 units), each unit—	
Motor cars	2
Motor cycle (side car)	1
X-ray truck	1
Motor trucks	2
Motor trucks (cargo, for moving only)	18
(i) Mobile surgical unit (20 units) each unit—	
Motor car	1
Motor cycle (side car)	1
Motor trucks (cargo)	3
(j) X-ray service, motor—X-ray trucks.	

2. For each corps (5 corps):

(a) Office of each corps surgeon—	
Motor cars	2
Motor cycles (side cars)	2
(b) Corps laboratories, each—	
Motor car	1
Motor cycle (side car)	1
(c) Dental service—dental car	1

3. For each division (30 divisions, including 10 replacement divisions):

(a) Each chief surgeon's office—	
Motor cars	3
Motor cycles (side cars)	2
(b) Division ^a laboratories (1 each)—Motor cycle (side car)	1
(c) Field hospitals (4 per division)—	
Motor cars	4
Motor cycles (side cars)	10
Repair trucks	4
Motor trucks	44
Trailmobiles	8
(d) Motor ambulance companies (4 per division)—	
Motor cars	6
Motor cycles (side cars)	12
Motor ambulances	48
Motor trucks	9
Trailmobiles	8
(e) Field signal battalion—motor cycles (side cars)	2
(f) Dental service—Dental car	1

Services of Supply:

(a) Chief surgeon's office—	
Motor cars	6
Motor cycles	4
Motor cycles (side cars)	3
Bicycles	5
(b) Divisions of specialists (laboratory service excepted)—	
The administration office—	
Motor car	1
Motor cycle (side car)	1
Chief of groups (2 main groups), each—	
Motor car	1
Sections ^b (9), each section—Motor car	1
One section—Motor cars	3
(c) Advance section—	
Surgeon's office	2
Motor cycles (side cars)	2
(d) Intermediate section, surgeon's office—	
Motor cars	2
Motor cycles (side cars)	2
(e) Base laboratories (4 laboratories), each laboratory—	
Motor car	1
Motor cycle (side car)	1
Special bacteriological car	1
(f) Base laboratories, central for hospital groups (28 laboratories), each laboratory—Motor cycle (side car)	1

^a Medical supply unit (attached to divisional headquarters), each unit, 1 motor car, 4 motor cycles (side cars), 2 motor trucks.

^b Recommended that G. U. section later have 3 cars and other 8 sections 2 each.

Service of Supply—Continued.

(g) Surgeons at base ports (5 bases)—	
Motor cars	5
Motor cycles (side cars)	5
(h) Base port transportation (3 bases), 1 motor ambulance company at each base—	
Motor cars	3
Motor cycles (side cars)	9
Motor ambulances	36
Motor trucks	9
Trailmobiles	6
(i) Medical supply depot (3 at ports; 2 in intermediate section; 1 in advance section; total, 6 depots), for each depot—	
Motor car	1
Motor cycle (side car)	1
Motor trucks	6
(j) Hospital centers (10 centers) each center—	
Motor cars	2
Motor cycles (side cars)	2
(k) Base hospitals (130), each—	
Motor cars	2
Motor cycles (side cars)	2
Motor ambulances	10
Motor trucks	3

EVACUATION AMBULANCE COMPANIES

The Manual for the Medical Department, United States Army, 1916, contained provisions for the organization of evacuation ambulance companies. Since these were to be organized only in time of war, it is needless to state that no such companies existed when we entered the World War.

They were to be in the proportion of one for each division at the front, and their primary function was to be the evacuation of division hospitals, and the care and transportation of patients therefrom to evacuation, base, or other hospitals on the line of communications, or to points with train or boat connections for rail or water transport to such hospitals. They were to be field army organizations, and their personnel and equipment were to be that provided for a division ambulance company with such modifications as might seem warranted.

On November 12, 1917, the Surgeon General notified the chief surgeon, A. E. F., that the organization of three evacuation ambulance companies had been begun and that the personnel of each would be two officers and 60 enlisted men, and that its equipment would be that of a motor ambulance company less dressing station equipment.²⁴ To this the chief surgeon replied requesting that vehicles for these units be increased from 12 to 20.²⁵

Independently, the chief surgeon, line of communications, on November 27, 1917, recommended that ambulance personnel and transport within his jurisdiction be organized into evacuation ambulance companies, each consisting of 5 sections with 20 ambulances each.²⁶ He also urged that if it were possible 30 sections of the United States Army Ambulance Service then in the United States but ready for shipment should be secured for the American Expeditionary Forces in order to avoid the complete breakdown which he considered immi-

ment.²⁶ He remarked that the need of evacuation ambulance companies was becoming more and more apparent.²⁶ The need for motor ambulance companies, conveniently located to meet current needs, instead of ambulances distributed among many combat and other organizations and the special need for such an organization (under the control of the advance section, Services of Supply) in the vicinity of the training areas was emphasized.²⁶ Others as needed were to be located at other places on the line of communications. It was anticipated that personnel and matériel might ultimately be supplied from the sections of the United States Army Ambulance Service but until that service's resources were more than enough to meet its own needs, our evacuation ambulance companies might be developed quickly though temporarily by drawing in from various base and other hospitals all available transport and personnel.²⁶ Even though such an organization might lack symmetry it would meet the situation temporarily until units of the United States Army Ambulance Service could be made available.²⁶ The memorandum further remarked that 88 sections of that service in the United States not yet assigned, might be considered available for requisition for service on the line of communications. The necessity of a maintenance department with ample spare parts and other equipment was noted and the necessity for the immediate establishment of an ambulance park in the vicinity of the training areas was emphasized.²⁶

The same date (November 27, 1917) the chief surgeon, A. E. F., initiated a cablegram to the Surgeon General to the effect that evacuation ambulance companies should be organized from the equipment and personnel of sections of the United States Ambulance Service, which had not yet been sent to France.²⁷

Under date of December 8, 1917, a memorandum for the chief surgeon, A. E. F., emphasized the need for organizing on a large scale transportation for casualties, noted the limited amount of transport and inadequate spare parts available at camp and base hospitals, and requested that the chief of United States Army Ambulance Service loan to the United States Army one ambulance company section.²⁸ It was further recommended that a cable be sent to the War Department requesting shipment of the necessary transport.²⁸ A few days later (December 13) the chief surgeon, A. E. F., received a report, from one of his subordinates who had been ordered to investigate transportation requirements, in which emphasis was laid upon the need for evacuation ambulance companies; the wasteful results of assigning ambulances to small scattered commands; the difficulty of making evacuations in training areas, and suggesting number and locations of companies, sources of personnel and matériel, facilities for repairs, etc.²⁹

On January 14, 1918, the chief surgeon, line of communications, reported that it was imperatively necessary to make provision for more motor ambulance transport in the advance section in order to evacuate the field hospitals, and recommended that a provisional motor ambulance company be organized from the resources of the 41st (the first depot) Division.³⁰ This recommendation was approved and the organization of this provisional company ordered January 17, 1918.³¹ This unit, first designated the 116th Evacuation Ambulance Company and later Provisional Evacuation Ambulance Company No. 1 was the first evacuation ambulance company of the American Expeditionary Forces. It was located at Toul.³²

In converting sections which had been organized in the United States for the United States Army Ambulance Service (to serve with the French Army) to evacuation ambulance companies, A. E. F., some complexities arose, shown best in the following correspondence.

In a letter which the Surgeon General wrote The Adjutant General of the Army on January 30, 1918, he stated:³³

1. In cable from the commanding general, American Expeditionary Forces, No. 322, paragraph 3, subparagraph A, it was stated that it was the unanimous opinion that evacuation ambulance companies be organized with the equipment and personnel of the sections of the United States Army Ambulance Service. This request was referred to again in a letter from the chief surgeon, A. E. F., written December 24.

2. In cable No. 486, paragraph 8, from the commanding general, A. E. F., the recommendation was made that the remaining 73 sections United States Army Ambulance Service be used in organizing the ambulance companies of the army sanitary train, item M201, and evacuation ambulance companies, M406, and that the remainder be drawn on for all ambulance personnel for replacement draft according to paragraph 4, cablegram 318.

3. The sections of the American Ambulance Service referred to are those now mobilized at Allentown, Pa.

4. It is the understanding in this office that when these sections were organized they were intended for service with the French Army, and they have heretofore been used for that purpose.

5. A decision is requested as to whether these sections could be used for the purpose indicated in General Pershing's cables.

6. It is to be noted that in some cases the officers attached to these sections are not medical officers. Also that they are equipped and have been trained with Ford ambulances, and that the ambulances provided for the ambulance companies of the Army are G. M. C.'s. Should the use of these sections be allowed, the personnel will differ from that as authorized for evacuation ambulance companies in the second indorsement of The Adjutant General's office, dated December 28, paragraph 3, subparagraph 8.

On March 12 The Adjutant General replied:³⁴

There is no objection to the use of the enlisted personnel of the American Ambulance Service now at Allentown, Pa., organized under section 2, General Orders, No. 75, War Department, June 23, 1917, as amended by section 1, General Orders, No. 124, War Department, September 20, 1917, for any purpose for which the enlisted personnel of the Medical Department may be used. The commissioned personnel may be used in a like manner except that those officers who are not doctors of medicine will be assigned to such duties as their technical training permits. It is, however, to be understood that this authorization in so far as it relates to these officers is not to be construed as in any way modifying the provisions of paragraph 3, Manual for the Medical Department, 1916, which prescribes that:

"An applicant for appointment in the Medical Corps of the Army * * * must be a graduate of a reputable medical school legally authorized to confer the degree of doctor of medicine, etc."

and as fast as these officers are separated from the service their places will be filled by the appointment of medical officers.

In connection with the personnel of evacuation ambulance companies, the Surgeon General on March 22, 1918, wrote The Adjutant General, United States Army, as follows:³⁵

1. Subparagraph H, paragraph 3, of second indorsement, Adjutant General's Office, December 28, 1917 (322.3 Medical Department, Misc. Div.), gives the personnel of evacuation ambulance companies as: 1 lieutenant, Medical Corps; 3 noncommissioned officers; 34 privates.

2. It is requested that this be amended to read as follows: 1 captain or lieutenant, Medical Corps; 3 noncommissioned officers; 3 mechanics; 2 cooks; 24 wagoners; 5 privates, first class, and privates.

3. In General Pershing's organization project for evacuation ambulance companies, all transportation is motorized and consists of 20 motor ambulances, 1 touring car, 1 motor cycle with side car, 2 motor trucks.

4. The unit is liable to expansion by the addition of other ambulances.

5. The 2 cooks for the organization are necessary, the 3 mechanics are required to keep the motor transportation in proper order, and the 24 wagoners are the chauffeurs.

This request was granted in the following terms:

The following personnel for evacuation ambulance companies has been approved: 1 captain or lieutenant, Medical Corps; 3 noncommissioned officers; 3 mechanics; 2 cooks; 23 wagoners; 6 privates, first class, and privates.

This authorization must not be construed to change the numbers or grades of medical officers provided for the Medical Department in War Plans Division 9199-25, approved February 4, 1918.

Unfortunately, as may be seen from the following references to correspondence between War Department and the American Expeditionary Forces, these sections were not made available until the end of hostilities. On August 26, 1918, the chief surgeon, A. E. F., initiated a cablegram to the Surgeon General, in which he requested that the personnel of 48 ambulance sections, under process of organization for service with the French Army, be sent to France as casualties and without officers, since it was his desire to appoint officers in the American Expeditionary Forces selected from experienced men, graduates of the French motor service school.³⁶ To these recommendations War Department replied that only 31 sections of the American Ambulance Company were available and that these would be shipped in September.³⁷ On September 14 the Surgeon General notified the chief surgeon, A. E. F., that the 31 sections would be formed and sent to the American Expeditionary Forces, and that the personnel of these sections would be available for shipment in October instead of September, as formerly stated.³⁸ On October 17 the Surgeon General notified the commander in chief, A. E. F., that Ford ambulances were being sent for the equipment of these sections.³⁹

As some difference of opinion had arisen between the Surgeon General and the chief surgeon, A. E. F., concerning the number of ambulance company sections which had been organized and the number of sections yet remaining available under the Executive order authorizing them, the chief surgeon, A. E. F., on September 21, 1918, reported to the Surgeon General as follows:⁴⁰

Commander in chief requested 48 ambulance sections as part of exceptional Medical Department replacements. The Adjutant General replied that only 31 sections were available. From the 169 sections had been already subtracted the number already organized, giving credit in the latter for 49 organized in France, whereas only 30 were organized there, and also they failed to consider 7 sections which had been disbanded and the enlisted personnel sent to France to fill up numerical shortages in the sections organized from the American Ambulance Service. It is a fact that there are 48 sections available and 9 others which; however, it is not deemed desirable to organize at the present time because the officers of these will be needed as supernumeraries for purposes of administration. It is requested therefore that the 48 sections asked for by paragraph 12, cable P 1591 be sent without officers in the manner requested by that cable. It is also requested that the shipment of Motor Transport Corps tonnage and allotment be made as called for, for October. Request every effort be made to ship material and personnel in October, and material remaining unshipped will be covered in November Motor Transport Corps priority.

On October 30 the Surgeon General cabled that 31 ambulance sections were formed and available and that the remaining sections, to complete the 48 asked for, would be ready to sail in a few days.⁴¹

Meanwhile, on September 26, 1918, the chief surgeon, A. E. F., recommended to the chief of staff, A. E. F., the issuance of a general order, whose terms he proposed, concerning the operation of ambulances in the Services of Supply.⁴² In brief this was to provide that all ambulances in that territory be assigned to 18 definite evacuation ambulance companies, with the enlisted personnel then assigned to duty with these vehicles. The personnel of each unit, as recommended, should be 2 officers (captains or first lieutenants, M. D.), 2 sergeants, first class, 4 sergeants, 23 wagoners, 1 cook, 1 mechanic, 20 privates, first class, and 5 privates.⁴² The units were to be equipped with 20 ambulances or more, 1 motor cycle with side car, and such temporary additional machines and personnel as might be necessary, and vehicles so far as possible were to be garaged at hospital centers, base hospitals, camp hospitals, and other camps where they were thus used, but would at all times be under the orders of the commanding officer of the respective companies.⁴² A list showed that from 9 to 22 ambulances were garaged at the more important localities in the Services of Supply. In support of this proposed arrangement the chief surgeon urged that this organization would promote service by the pooling of ambulances and would provide units which in emergency could be sent to the zone of the advance.⁴² To these recommendations the chief of staff replied that as the assignment of ambulances was under the jurisdiction of the chief surgeon it was believed that they could be distributed by him as required for the purpose mentioned.⁴³ The formation of provisional evacuation ambulance companies of varying strength, as outlined by the chief surgeon, was not favorably considered.⁴³

On November 2 the chief surgeon, A. E. F., requested orders concerning pooling of ambulances at base ports, hospital centers, and other localities in the intermediate and base sections of the Services of Supply,⁴⁴ but the general staff, general headquarters A. E. F., ruled that such orders were unnecessary, ambulances being under the jurisdiction of the chief surgeon and he enjoying authority to pool them if he so desired;⁴⁵ accordingly, the chief surgeon, on November 6, 1918, issued orders that this be done.⁴⁶

A total of 82 evacuation ambulance companies (including Provisional Ambulance Company No. 1) saw service in the American Expeditionary Forces.³² Of these, 12 which arrived after the armistice was signed were disbanded and their personnel reassigned in base section No. 2.³²

Those which served overseas before the armistice, November 11, 1918, are discussed individually in Volume VIII.

ASSEMBLY, SALVAGE, AND REPAIR

Assembly, salvage, and repair of ambulances were important activities pertaining to their provision and adequacy within the American Expeditionary Forces.

On May 4, 1918, the chief surgeon informed the Surgeon General⁴⁷ that motorized Medical Department organizations under orders for France should

leave the vehicles they used while training at their respective training areas, receiving new and standard motor equipment in France.

This procedure was to obviate transporting used machines, which in most cases could not reach France until after the organization had been supplied there with other standard vehicles, another unit later receiving the used cars, which were apt to be minus part of their equipment and tools.

In the early days of the war the General Motors Corporation type of ambulance was adopted, because of its capacity.¹⁶ The ambulances were shipped to France, unassembled, the constituent parts of the bodies being placed in crates, and a series of envelopes were made up containing the number of screws, bolts, and nuts necessary for assembling the ambulances.¹⁶ Each operation was numbered and the corresponding number was placed on the envelope containing the hardware used.¹⁶ This ambulance body was not what is regularly known as a knocked-down body, and it was appreciated that considerable difficulty would be encountered in its assembly, unless trained men fully familiar with body construction were available in France.¹⁶ The Surgeon General's Office accordingly organized a unit known as the motor ambulance assembly detachment, consisting of 3 officers in the Sanitary Corps and 60 body builders and motor experts.¹⁶ After arrival in France this ambulance assembly unit began operations on January 2, 1918, at St. Nazaire.¹⁶ Within two weeks the necessary shelters had been constructed, power lines had been run, and the ambulance assembly commenced.¹⁶ A number of chassis and bodies had accumulated on the beach at St. Nazaire, and there was an urgent call from various organizations and divisions then in France for ambulances. The shop soon took on the appearance of a modern American factory and ambulances were turned out at the rate of 4 a day. This number was gradually increased until a daily output of 15 was reached.¹⁶

It was expected that all motor transportation would be delivered at the port of St. Nazaire.¹⁶ This, however, proved to be impracticable, and before long ambulances were being received at Le Havre, Brest, Bordeaux, Marseille, and La Pallice.¹⁶ Certain numbers of the original motor ambulance assembly detachment were sent to the parks at these ports and soon built up assembly organizations composed of Medical Department personnel and Motor Transport Corps personnel and the same efficiency was obtained as at St. Nazaire.¹⁶

In general orders, general headquarters, A. E. F., and headquarters, Services of Supply, ambulances were classed as "special vehicles."¹⁶ While orders covering assignments had been prepared by the Motor Transport Corps, all requisitions had been submitted to the chief surgeon's office, A. E. F., and that office had submitted requests to the Motor Transport Corps to assign ambulances to the points where they were most needed.¹⁶ Many organizations to which ambulances were assigned in the United States delivered them to the ports of embarkation there and they were shipped to France whenever practicable. However, no notice of prior assignment was taken in France and all motor transportation received was pooled.¹⁶

About one month before the armistice was signed a new type of knocked-down body was shipped to France. Inasmuch as it was assembled and painted in the factory and was then taken down in sections and shipped in crates, con-

siderable time was saved in the final assembly at base ports in France and very much less personnel was required to operate the body shops. Four men could assemble two bodies in a day.¹⁶

The total number of ambulances shipped to France and Italy was 6,875; 3,805 were of the Ford type and 3,070 General Motors Corporation type.¹⁶ The former were used especially for primary evacuations in rear of the fighting line and the latter in other services farther to the rear and throughout the Services of Supply. There was never sufficient transport for the sick and wounded.⁴⁸ Shortage of ambulances was placed at 40 per cent in April, 1918, at 50 per cent in September, and at 20 per cent in October of that year. Only by borrowing from the French and Italian Governments 30 of the ambulance sections loaned by the United States to those countries could our needs be met in the St. Mihiel and Meuse-Argonne offensives.⁴⁸

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32. Report on evacuation ambulance companies (undated) made to the chief surgeon, A. E. F., by the officer in charge of transportation, chief surgeon's office, A. E. F. On file, Historical Division, S. G. O.
33. Letter from the Surgeon General to The Adjutant General of the Army, January 30, 1918. Subject: Use of sections U. S. Army Ambulance Service as evacuation ambulance companies. On file A. G. O., 322.3 (Ambulance companies, E. E., Miscellaneous Division).
34. Second indorsement from The Adjutant General to the Surgeon General, March 12, 1918; on letter from the Surgeon General to The Adjutant General, January 30, 1918. Subject: Use of U. S. Army Ambulance Service as evacuation ambulance companies. On file, A. G. O., 322.3 (Ambulance companies, E. E., Miscellaneous Division).
35. Letter from the Surgeon General to The Adjutant General of the Army, March 22, 1918. Subject: Personnel evacuation ambulance companies. On file, S. G. O., Record Room, 322.3212 (Evacuation ambulance companies).
36. Proposed cable from the chief surgeon, A. E. F., to the Surgeon General, U. S. Army, August 26, 1918. On file, A. G. O., World War Division, chief surgeon's files (322.3211).
37. Cable No. 1881-R, par. 6, from The Adjutant General to General Pershing, August 28, 1918. Copy on file, A. G. O., World War Division, chief surgeon's files (322.3211).
38. Letter from the Surgeon General, U. S. Army to the chief surgeon, A. E. F., September 14, 1918. Subject: Army Ambulance Service. On file, A. G. O., World War Division, chief surgeon's files (322.3211).
39. Cable No. 2035 R., par. 3, from The Adjutant General, to General Pershing, October 17, 1918. Copy on file, A. G. O., World War Division, chief surgeon's files (322.3211).
40. Courier cable from the chief surgeon, A. E. F., to the Surgeon General, U. S. Army, September 21, 1918. On file, A. G. O., World War Division, chief surgeon's files (322.3211).

41. Cable No. 45, from The Adjutant General, to the commanding general, A. E. F., October 30, 1918. Copy on file, A. G. O., World War Division, chief surgeon's files (322.3211).
42. Letter from the chief surgeon, A. E. F., to the chief of staff, A. E. F., September 26, 1918. Subject: Proposed general order for evacuation ambulance companies. Copy on file, A. G. O., World War Division, chief surgeon's files (322.3211).
43. Memorandum from the assistant chief of staff, G-1, general headquarters, A. E. F., to the chief surgeon, A. E. F., October 18, 1918. Subject: Proposed general order for evacuation ambulance [companies. On file, A. G. O., World War Division, chief surgeon's files (322.3211).
44. Memorandum from the chief surgeon, A. E. F., to the assistant chief of staff, G-4, general headquarters, A. E. F., November 2, 1918. Subject: General order for operation of ambulance service in S. O. S. On file, A. G. O., World War Division, chief surgeon's files (322.3211).
45. Memorandum from the assistant chief of staff, G-4, general headquarters, A. E. F., to the chief surgeon, A. E. F., November 5, 1918. Subject: General order for operation of ambulance service in S. O. S. On file, A. G. O., World War Division, chief surgeon's files (322.3211).
46. Circular letter (not numbered) from the chief surgeon, A. E. F., to base surgeons, November 6, 1918. Subject: Pooling of ambulances. On file, A. G. O., World War Division, chief surgeon's files (322.3211).
47. Letter from the chief surgeon, A. E. F., to the Surgeon General, May 4, 1918. Subject: Overseas motor transportation. On file, A. G. O., World War Division, chief surgeon's files (451).
48. Report from Brig. Gen. J. R. Kean, M. C., to the chief surgeon, A. E. F., April 24, 1919. Subject: Data to be used by the Military Board of Allied Supply. On file. Historical Division, S. G. O.

CHAPTER XVIII

THE DIVISION OF HOSPITALIZATION (Continued)

THE PROFESSIONAL SERVICES ORGANIZATION

The organization of the professional services in the American Expeditionary Forces, conformably to a plan which had been developed in the Surgeon General's office, was undertaken by the chief surgeon in the autumn of 1917. In Circular No. 2, November 9, 1917, chief surgeon's office, the organization of these services was prescribed and the scope of their activities defined. This circular provided for eight services each under a director, and for the future assignment of assistant directors, consultants for corps, administrative sections of the line of communications, larger hospital centers, and other commands. The services prescribed were general medicine; general surgery; orthopedic surgery; surgery of head; urology, skin, and genitourinary diseases; laboratories; psychiatry; Roentgenology. It emphasized the fact that professional authority did not include administrative control; directors were to be immediately responsible to the chief surgeon, and the professional services of hospitals were to be so organized that they conformed to the eight divisions prescribed above.

At about this time, a plan for the organization of the professional services in hospitals was formulated in the Surgeon General's Office,¹ but no copy of this was received by the chief surgeon until several months later, and after a statement of organization of the professional services in the American Expeditionary Forces had been cabled to the War Department.²

On March 9, 1918, the Surgeon General wrote the chief surgeon as follows concerning the organization of the professional services in base hospitals:³

1. The attention of the hospital division has just been called, for the first time, to your letter of November 9, Circular No. 2, paragraph 5, in which it is noted that the commanding officer of each base hospital is directed to organize his hospital by the assignment of suitable officers to duty in charge of each of the eight sections, and that each chief of section will report direct to the commanding officer, to whom he will be responsible for the operation of his particular section.

2. Attention is invited to the fact that this is not quite in accord with the plan of organization adopted by the Surgeon General of the Army in his memorandum of November 11, which should have been sent to you at that time.

3. It will be noted that instead of having eight independent sections there are three main clinical services—surgical, medical, and laboratory—with a chief of each, and that each service is divided into sections representing the different special branches, eight in all. This was the result of many conferences and was finally adopted as a better plan of organization than to have the eight independent sections.

4. It is not contemplated that this arrangement will in any way interfere with the work of the different sections, but that the chief of each service will be the responsible coordinating officer for all of the different sections of that service and that he will be responsible directly to the commanding officer for the work of all the sections under his control.

5. It is not considered that this plan of organization of base hospitals would in any way interfere with your plan of organization, as provided for in paragraphs 1 and 2 of your Circular

No. 2. All base hospitals now organized and in process of organization in this country for service overseas are being organized in accordance with the Surgeon General's memorandum of November 11.

In another letter to the chief surgeon, dated March 16, 1918, the Surgeon General stated that the plan under which his office was then working provided for nine sections, instead of eight, among the professional services.⁴ One section concerned with food and nutrition had been added.

While the Surgeon General and the chief surgeon, A. E. F., were thus developing a continuity of policy in the provision and the orientation of the professional services, the services themselves were undergoing rapid development.

DEVELOPMENT

By General Orders, No. 58, general headquarters, A. E. F., November 10, 1917, "directors," as the chiefs of the several specialties were first designated, were appointed, respectively, for the laboratory service, general surgery, orthopedic surgery, and venereal, skin, and genitourinary diseases. In the following month a director of psychiatry was designated and directors of Roentgenology and general medicine in March of the following year.

On December 21, 1917, the following letter of instructions, which was typical of that issued to other directors, was forwarded to the director of general surgery:⁵

You are hereby announced as director of the division of general surgery for the American Expeditionary Forces.

You will proceed to such places in the training areas as may be necessary from time to time for consultation with medical officers serving with the American Expeditionary Forces, in matters pertaining to general surgery.

In this connection, your attention is invited to General Orders, No. 58, dated November 10, 1917, an advance copy of which is herewith furnished you.

At the end of each month you will submit, for confirmation by these headquarters, a list of the journeys performed by you under these instructions.

Commanding officers of the places visited by you are hereby directed to afford you proper facilities for carrying out this work; this letter to you is to be considered their authority for such action.

Chiefs of all services were announced and their new official designation prescribed by General Orders, No. 88, general headquarters, A. E. F., June 6, 1918, which is discussed below.

As shown by the histories of the individual services, there was great development of their activities prior to the publication of the general order last mentioned. The directors of all except the laboratory service were congregated at Neufchateau, where they were technically under the control of the hospitalization division of the chief surgeon's office, which was located from September 1, 1917, to March 18, 1918, at Chaumont, some 45 miles distant.⁶ Means of communication between the two offices were at first very limited, for transportation was scant, and mail and telephone facilities inadequate. The group continued to receive its orders from the chief surgeon's office even after this had been moved to Tours.⁶

Until April, 1918, the group of directors did not function as an organized body, therefore their activities were uncoordinated, each director seeking to solve in his own way his very different and difficult problems.⁶ No specific

instructions had been issued governing their status. The only office provided until April, 1918, which had the power to coordinate the efforts of this group was that of the chief surgeon, A. E. F., which, meanwhile, was being concerned with many other urgent responsibilities.

It is necessary to visualize the situation of the directors in the fall of 1917, and during the earlier succeeding months, in order to appreciate the difficulties of their task. Headquarters, A. E. F., including the chief surgeon's office, were undergoing rapid expansion and incessantly meeting new emergencies. The new professional directors, lacking military experience, were further handicapped through not having special regulations detailing their duties, and by lack of an agency for their effective organization and control.⁷ Each director believed that his appointment granted him authority to organize and direct separately his special department. Each was an enthusiast in his own specialty and the misnomer "director" seemed to imply administrative control which in fact was not conferred.⁶ Yet the direction and supervision of the professional services in all sanitary formations, the provision for continuity of treatment from front to rear, the modification, as need be, of accepted methods of treatment and the inauguration of new ones, were some of the duties with which they were charged.⁸ In the absence both of military experience and of specific instructions some confusion was inevitable, and for these reasons the zeal of the directors was at first to an appreciable degree misdirected as well as uncoordinated.⁶

Great embarrassments also developed in supplying members of the group with transportation, for each director was authorized to utilize an automobile for an unlimited time, though the multiplicity of their organizations and the shortage of motor vehicles rendered their supply very difficult.⁶

During this period many of the most able operators had been detailed as consultants in divisions and other formations, and thus removed from that service which they were peculiarly able to perform.⁹ The professional services were thus deprived of many of their best clinicians, for these officers were placed in positions where they, under existing conditions, could neither exercise their professional attainments nor handle properly the new situations that arose.

When junior members of the special professional services began to arrive and were assigned to combat divisions, the complications pertaining to the general operation of the professional services considerably increased.⁷ These officers were not recognized in the Tables of Organization, and the details of arranging for billets, mess facilities and transportation already greatly overtaxed were therefore difficult. For this reason the divisional specialists were assigned for billet and mess to field hospitals or to those facilities at division headquarters which accommodated transients and officers of junior rank.⁶ Assignment to divisional hospitals separated them from the division surgeon, for these units were not located at headquarters and this precluded the best performance of the specialists' duties which were divisional in scope. These complications now seem trifling, but they led to disturbed feelings which impaired the usefulness of the junior consultants.⁷

Usually division surgeons were officers of the Regular Army, and were trained along line of military administrative control. The specialist presented a new problem concerning which the division surgeon had not been sufficiently informed.⁷ The division surgeon had the choice of taking the specialist into his own overcrowded office, forcing him into a mess, where, usually, he was not wanted because of inadequate facilities and because he did not hold one of the positions which entitled him to membership, urging a harassed billeting officer to make room for him in an overcrowded headquarters town, or sending him to a hospital where also he was at once regarded as a person apart.⁷ The specialist, because of his new and unique status, was brought out in sharp contrast to the other medical officers serving with divisions.⁷ If he was not tactful, and he was not always so, his position was difficult. The division surgeon found it hard to make suitable arrangements for specialists even in billeting areas, and when battle conditions ensued the situation was almost impossible.⁷

By the spring of 1918, several divisions were in the firing line and additional divisions were arriving rapidly.¹⁰ As corps and armies were formed, the complexity of the situation for the consultants increased enormously.⁷ Medical officers in administrative positions, as well as the specialists, knew that a defective plan was in operation. All professional branches still lacked coordination and there was much confusion of activity; there were too many orders, too many reports, too many inspection trips; uncoordinated ideas were surging up from below, and until April, 1918, there was lack of effective administration from above.⁶ As the functions of the specialists were not well defined, the problems of the special branches were being handled by many different methods.

Some of the difficulties experienced by the consultants with divisions did not as a rule exist in the hospital centers.¹¹ There the consultants usually were chiefs of services of base hospitals, who were assigned as consultants in addition to their other duties. Their living facilities were thus already provided and the geographical scope of their activities was limited. Though often harassed by demands from the directors for reports, the duties of their positions were generally well understood and systematically performed. There were some differences in the methods followed by the several services, but there were many basic similarities.

Though considerable attention is given above to the early lack of coordination, to the initial misconception of their duties on the part of directors, and to the difficult position which the specialists occupied with divisions, the fact should be stressed that despite these handicaps the initial work accomplished was of very great importance.⁷ After the group of chiefs of service at Neufchateau was reorganized in April, 1918, its efforts coordinated, and the duties of its members more clearly defined (in Circular No. 25, chief surgeon's office, A. E. F.), the value of the consultants' services was greatly increased.⁷

On April 18, a director of professional services was appointed with station at Chaumont,⁶ his office, for purposes of coordination, being in juxtaposition to that of the representative of the chief surgeon, A. E. F., with the general staff.¹² In the letter notifying him of this assignment the chief surgeon wrote as follows:¹³

* * * * *

By virtue of this appointment, you are empowered to represent the chief surgeon, A. E. F., in all matters pertaining to the administration, direction, and coordination of the professional services. You are responsible for such professional matters relating to hospitalization, evacuation, laboratories, sanitation, and other activities as may pertain to the proper sorting, distribution, and evacuation of sick and wounded through the channels that will best insure efficient treatment from the front to the rear.

All requests for the movement of personnel and supplies originating in the professional services will be forwarded by or through you to the chief surgeon, A. E. F., or to some one designated by him.

The consultants in the professional divisions will be recommended by you for detail as teachers at the Army Sanitary School in such numbers and at such intervals as may be requested by the commandant of the school. In order that recent methods of treatment may be standardized, it is desired to make the instruction course at this school as thorough and intensive as circumstances will permit, and no effort will be spared in securing all instruction hours possible on the schedule of the school.

There is transmitted a tentative scheme of organization for the divisions under your control, and, after it has been given a fair trial, should any changes, in your opinion, seem warranted, you will submit appropriate recommendations to this office for recommendation.

The tentative scheme of organization to which allusion was made in this letter was published, as finally developed, in Circular No. 25, chief surgeon's office.

This circular charged the director with the supervision and coordination of the professional activities of the American Expeditionary Forces. The chief consultant in surgery was charged with the supervision of the professional surgical subdivisions, their organization and coordinations; with timely recommendations concerning changes in personnel, the formation of surgical teams and reports of their activities; with recommendations concerning inspections of his specialty. The chief consultant of the medical services was similarly charged with supervision of the medical subdivisions in the American Expeditionary Forces, and with such recommendations as were necessary to insure a high professional standard and complete harmony among his assistants in all formations. Senior consultants were to coordinate under their respective chiefs, professional activities pertaining to their respective specialties, and to make appropriate recommendations for instruction of consultants and specialists in divisional or other formations.

One senior medical and one surgical consultant, were to be assigned to each tactical organization equivalent to an army corps, and consultants were to be appointed in such numbers as might be necessary to assist divisional consultants. Senior division consultants were to be responsible for the duties theretofore discharged by division consultants, were to make frequent and complete surveys of professional practices in the division, supervise the activities of consultants, operating teams and other professional personnel attached to the division; organize and distribute such teams, including those which would serve newly arrived troops, and promote their efficiency; render appropriate reports, returns, and recommendations to the chief surgical consultant.

You will direct the compilation of a classified roster by each chief consultant, of all professional personnel, such as specialists, consultants, or surgical teams among the various army units of our own and allied formations, so as to facilitate their proper distribution and utilization in emergencies as well as in routine. When the organization of the professional service is completed, you will direct its workings, either from general headquarters or such other places as best serves the interests of the service.

With the three original divisions, medicine, surgery and laboratories as a basis, you will so coordinate the activities of the subdivision thereof that scientific research and clinical proficiency may be effectually promoted.

Circular No. 2 and Circular No. 11, this office, will be revoked or modified, as will all other orders, letters and instructions heretofore issued which conflict with the instructions contained in this communication.

A circular is now being prepared in this office along these lines.

The senior divisional medical consultant was to secure medical cases the best and most advanced treatment possible and make appropriate reports and recommendations to the chief medical consultant.

The divisional surgical consultant was to exercise immediate supervision over the work of operating teams in the division, but in time of mobile or semi-mobile warfare and when evacuation hospitals were lacking, this supervision was to be exercised by the senior divisional consultant or his assistant, over teams working in hospital for nontransportable wounded. Direction and supervision of the purely operative work in divisional formations was a duty of the senior divisional surgical consultant or his assistants. Divisional medical consultants were to supervise the immediate medical activities in the division to which they were assigned. The division surgeon was to furnish the necessary hospital facilities, supplies, and personnel other than those forming teams.

Such consultants for base hospital groups as were thought necessary by the chief surgical and medical consultants were to be appointed from time to time. Base and other hospitals so far as possible were to be organized in three services—surgical, medical, and laboratory—each under a chief of service. Under the chief of the surgical service were grouped general, orthopedic, and head surgery, including that of the brain, nervous system, eye, ear, nose, throat, face, and mouth; urology; roentgenology; and dentistry. Under the chief of the medical service were general medicine, neurology, and psychiatry, and under the chief of the laboratory service, pathology, bacteriology, and serology.

The first copies of Circular No. 25 were received simultaneously with the notice that the corps would not function while our divisions were reenforcing the French, and it was modified to permit the appointment of consultants to the tactical equivalent of an army corps.⁶ One week after Circular No. 25 was issued other changes were again instituted which permitted the consultants for corps to function.⁶

In effecting the reorganization of the professional services, the director of these services found himself considerably embarrassed by the fact that individual organizations had been built up around each director; the harmonizing of these, their coordination and symmetrical development, therefore, were very difficult.⁶

An effort was made to procure a copy of the card index, prepared in the office of the Surgeon General, showing the professional qualifications of all officers in the American Expeditionary Forces, but this was unsuccessful and the director was obliged, in making assignments, to rely upon his very inadequate personal⁶ knowledge of the ability of each officer concerned.⁶

The publication on June 6, 1918, of General Orders, No. 88, general headquarters, A. E. F., gave the directors, whose titles were now changed to consultants, a status in the forces generally which promoted a boarder appreciation of

their responsibilities.⁶ This order directed that there be appointed for the coordination and supervision of the professional care of the sick and wounded of the American Expeditionary Forces a director of those services, and a chief consultant in medicine and in surgery, respectively; also, that there be appointed for each army chief consultants, senior consultants, and consultants in special subdivisions of surgery and medicine. It also assigned selected officers as director of professional services, as chief consultants in the surgical and medical services, and as senior consultants in the following branches: General medicine; roentgenology; surgical research; neurological surgery; orthopedic surgery; ear, nose, and throat surgery; general surgery; neuropsychiatry; venereal, skin, and genitourinary surgery; maxillofacial surgery; ophthalmology. The order further directed that other senior consultants and consultants for hospital centers and other formations be designated from time to time as the need for them arose and that specialists in neuropsychiatry, urology, and orthopedic surgery be appointed from the divisional sanitary personnel.

It will be observed that Circular No. 25, unlike Circular No. 2, chief surgeon's office, A. E. F., did not include the laboratory division among the professional services, except in so far as the organization of base and general hospitals was concerned. Nor was that division included among them by General Orders, No. 88. Nevertheless, Circular No. 25, recognized the close relationship of this specialty and that of dentistry with the other services by including them with the special services in the hospital organization which it prescribed.

By General Orders, No. 88, and by Circular No. 25 the professional services were centralized and their efficiency greatly enhanced.

On August 7, 1918, the chief surgeon, A. E. F., wrote to the director of professional services stating that it was desired to have consultants in various specialties stationed at each hospital center; he was requested to nominate the officers who would be ordered to these centers for duty.¹⁴ These consultants were to include a specialist in diseases of the heart and one specialist in orthopedics who it was planned would be attached to each convalescent camp which formed part of a hospital center.

Each of these consultants was notified of his appointment and informed that he was expected not only to act as consultant for the hospitals in his center, but also that at regular intervals he would visit others, which his letter of assignment designated.¹⁵ With respect to the hospitals visited, these visits were to be made of service in establishing standardized methods of treatment and to assist in selection of cases for evacuation to the United States or to other hospitals.

On August 13, 1918, the chief surgeon asked the director of professional services to designate certain hospital centers to which specialists arriving in France might be sent, both in order to expedite their clearance from depot divisions and to determine their capabilities.¹⁶ At that time Roentgenologists were being sent automatically to the hospital center at Bazoilles, and it was desired that officers skilled in other specialties be similarly distributed to other selected places. The distribution was not to be made to apply to surgeons and internists who had not practiced specialties. It was, therefore, recommended that psychiatrists and neurologists who arrived as casualties be sent to Base Hospital No. 117

at La Fauche; specialists in eye, ear, nose, and throat surgery and ophthalmology to Base Hospital No. 115, at Vichy; specialists in tuberculosis to Base Hospital No. 8, at Savenay; urologists and dermatologists to Base Hospital No. 66, at Neufchateau; orthopedic surgeons to Base Hospital No. 9, at Chateauroux, and specialists in neurosurgery to Base Hospital No. 46, at Bazoilles.⁷

On August 27, 1918, certain orthopedic surgeons were appointed consultants in their specialty for designated districts.¹⁷ Hospitals and other formations in those districts which needed their services were authorized to apply to the nearest consultant at the address given in Circular Letter No. 7a. This circular gave the names of these consultants, their respective addresses, and the hospitals, hospital centers, and depot divisions which each of these consultants was expected to serve.

On September 2, 1918, the chief consultant of the medical and surgical services informed the chief surgeon that in order to meet the needs for qualified medical officers, it was essential that the chief consultants be authorized to reserve such officers as might be necessary to carry out the work in their several departments.¹⁸ They requested that the chief surgeon authorize such reservation of medical officers, and that their representatives be instructed to confer with representatives of the chief surgeon in order to prepare and put in operation a method for dealing with questions relating to the personnel of the professional services. The chief surgeon considered this plan practicable within certain limitations and arranged for a conference whereby a thorough understanding might be reached of the points involved.

On the same date the chief surgeon notified the director of professional services that certain officers had been designated professional consultants and heart specialists at five of the more important hospital centers; also, that they had been informed that this designation did not necessarily relieve them from their other duties.¹⁹ It was requested that, if possible, in making future recommendations to fill other vacancies among consultants in hospital centers, some officer belonging to a unit in the center be selected.¹⁹

On September 8, at the instance of the director of the professional services the following general letter was addressed by the chief surgeon to all division surgeons concerning the service of psychiatrists, urologists, and orthopedic surgeons assigned thereto:²⁰

There is apparently some misunderstanding among division surgeons relative to the duties and status of specialists assigned to divisional formations for duty.

During the recent activities one division surgeon assigned the psychiatrist to dressing the slightly wounded. While he was engaged at this work, several hundred cases of slight war neurosis were evacuated that would never have left their division if they had been examined by a trained psychiatrist.

The above instance is cited to show the importance of properly utilizing the services of these trained specialists with a view in this instance of avoiding a repetition of the experiences during the recent activities, when a total of nearly four thousand cases of slight war neurosis were evacuated to base hospitals that should never have left their divisions.

I. GENERAL STATUS AND DUTIES

Orthopedists, urologists and psychiatrists are attached to tactical divisions solely to aid in dealing with the medical and surgical problems of the divisions.

Their activities have two objects: (a) To keep the fighting strength of the division at the highest possible point and (b) to bring about the prompt elimination from the division of those who become unfit for duty.

These three branches of medicine and surgery are represented because they are concerned with those diseases and injuries which experience shows contribute most to noneffectiveness of individual soldiers and troops in general.

The function of these specialists is to help the division surgeon in the clinical work of the division in much the same way that the sanitary inspector does in sanitation and the assistant to the division surgeon in administration. They should be attached to the office of the division surgeon as additional assistants. In no other way can they render efficient service. Their permanent assignment to any subordinate sanitary formation of the division inevitably curtails their usefulness. In periods of stress, however, they should be stationed by division surgeons in the post in which they can work to the best advantage (e. g. orthopedists and psychiatrists in triages, the urologist in the surgical hospital during combat).

They should not be regarded as consultants representing an organization outside divisional control, but as integral parts of the division sanitary personnel, wholly concerned with the medical work of the division to which they are attached and directly under the supervision of the division surgeon.

II. SPECIFIC DUTIES

ORTHOPEDISTS

Division in training or rest.—(1) Instruction in application of splints and dressings to entire sanitary personnel.

(2) Instruction in proper care of the wounded during transportation.

(3) Instruction in prevention and treatment of shock and hemorrhage.

(4) Examination and reclassification of those unfit for combat due to faulty posture and foot disabilities.

(5) The inspection of shoes and instruction in proper shoeing and care of the feet.

Division in combat.—(1) Supervision of supply and distribution of splints and dressings.

(2) Continuance of instruction in application of splint dressing, treatment of shock and hemorrhage, and care of wounded during transportation.

(3) Supervision of surgical treatment of wounded from front line to hospital.

(4) Prophylaxis of foot conditions arising in trench warfare.

UROLOGISTS

Venereal diseases.—Prophylaxis of venereal diseases: (1) Lectures to medical officers and personnel of prophylactic stations.

(2) Inspection of prophylactic stations as to proper location, equipment, personnel, technique, results, and failures.

(3) Cooperation with the A. P. M. in investigation of local conditions concerning prostitution, regulated and clandestine, and alcoholism.

Treatment: (1) Supervision of physical inspections, early recognition of venereal cases and evacuation to medical labor camp.

(2) Supervision of genito-urinary treatment and operations in divisions.

Skin diseases.—Prophylaxis: (1) Cooperation with other departments and officers concerned in the bathing and disinfecting of troops and equipment.

(2) Instruction of personnel assigned to bathing establishments in the prompt recognition of skin diseases, and the importance of removing them at once from their commands.

(3) Supervision of inspections for skin diseases made simultaneously with venereal inspections.

Treatment.—Supervision of treatment of skin diseases in field hospital or other medical unit assigned for the purpose.

Cooperation with the senior consultant in venereal, skin, and genito-urinary diseases through the division surgeon in accumulation of data concerning venereal, skin, and genito-urinary surgery, by monthly reports.

PSYCHIATRISTS

Division in training or rest.—(1) Elimination of insane, feeble-minded and epileptic (especially among replacements).

(2) Mental examination of general prisoners in accordance with section 11, General Orders, No. 56, current series.

(3) Instruction of medical officers regarding diagnosis, early management, and prevention of war neurosis (shell shock).

Division in combat.—(1) Examination and sorting of officers and men returned to advanced sanitary posts for exhaustion, concussion by shell explosion, and war neurosis in order to control their evacuation.

(2) Treatment of light cases of exhaustion, concussion, and war neuroses in divisional sanitary formations so as to preserve the greatest number possible for duty.

(3) Mental examination of general prisoners and men suspected of having self-inflicted injuries.

Concerning the withdrawal of consultants from the army corps, the chief surgeon of the First Army Corps, on November 4, 1918, forwarded the following record of his analysis of the situation:²¹

The chief surgeon, First Army Corps, desires to call attention to certain features connected with the organization of the Medical Department of a corps.

There appears to be a tendency to withdraw corps consultants. The undersigned believes this would be a vital mistake.

The corps surgeon should have on his staff the following: (a) Internist; (b) psychiatrist; (c) urologist work during active operations is concerned largely with bathing, delousing, and skin diseases; (d) orthopedist; (e) medical gas officer; (f) sanitary inspector.

Evacuation of sick and wounded should be supervised by the commanding officer, corps sanitary train.

All the above men should be carefully selected in order that each fits perfectly into his place. Each must have the undivided support of the corps surgeon.

Concentration of these specialists in an army and attempting to control the work of divisions without working through the corps will result in inefficiency. The army is too far removed from the front line. Personal contact with conditions in the front line is absolutely essential in order to properly appreciate the difficulties connected with divisional work and to formulate means for their correction.

The only consultant whose services can be dispensed with in a corps under present conditions is the surgical consultant. The chief surgeon, First Army Corps, however, feels that mobile hospitals should be under the control of the corps surgeon, and in that event a corps consultant in surgery would be indispensable. Mobile hospitals should work so far forward that only the corps surgeon is sufficiently familiar with conditions to determine promptly when and where they should be moved. The present system has not been satisfactory.

Divisions need constant supervision in all phases of their medical, surgical, sanitary and evacuation work. Obviously, the corps surgeon would be helpless in attempting such supervision alone. His staff of consultants furnishes him with an invaluable means for keeping in touch with every phase of the work in the various divisions, and if properly selected, supervised and supported, they are absolutely indispensable in enabling the corps surgeon promptly to detect defects and to correct them.

This can not be done from an army largely because of the lack of personal contact.

In this plan, each division consultant would be under the direct supervision of the corresponding corps consultant; each corps consultant under the supervision of the corresponding army consultant; each army consultant under the supervision of the corresponding chief consultant, G. H. Q., A. E. F. The chief consultant, general headquarters, A. E. F., would formulate policies—the army, corps, and division consultants would be responsible that these policies are enforced. Without supervision, they will not be carried out; with proper organization and supervision, they will be carried out.

The above plan gives a logical, balanced organization that will bring results. If corps supervision is not included, there will be a missing link that will mean inefficiency.

Transportation is of course vital. Without it, consultants in either army, corps or division are helpless.

It may be possible at some latter date that divisions may become so experienced and well trained that this supervision may not be necessary. This is certainly not true at present and we do not believe it will be true during the continuance of this war.

The chief surgeon, First Army Corps, feels so strongly in this matter that, in case the corps consultants are not included as the general policy, he requests that the First Army Corps be permitted to retain the staff as outlined above.

In commenting upon the above-outlined plan the chief surgeon, First Army, stated:²²

It was thought at first the duties could be performed by assigning consultants to the army with assistants to work with the corps, but this plan has not proven effective due to the great distance the combatant troops are from the army headquarters, rendering it impossible to keep in touch with them with the paucity of transportation.

The paucity of truck transportation has precluded the further use of complementary groups with divisions, and it has been necessary to move the mobile hospitals far to the front to act as nontransportable hospitals, using the corps field hospitals for reservoirs.

The attitude of the chief consultant in surgery, concerning the plan of the chief surgeon, First Army Corps, was expressed by him as follows:²³

The plan as outlined by Colonel Grissinger with reference to corps consultants is most heartily approved.

His suggestion with regard to the disposition of mobile hospitals and their control by the corps surgeon has been fully justified by recent experiences in the Argonne and is also concurred in.

* * * * *

On November 16, 1918, the chief surgeon instructed the director of professional services to confer with the chief consultants in medicine and surgery at the earliest possible date, with a view of compiling a report on the activities of the different subdivisions of medicine and surgery.²⁴ He felt that by utilizing the services of the officers in the professional services during the then inactive period, every phase of the subject, from front to rear, could be covered without difficulty.

Unfortunately the early dissolution of the consultants' staff and the return of many of them to the United States prevented a full realization of the chief surgeon's project.

ACTIVITIES OF THE SURGICAL SERVICES

GENERAL SURGERY ^a

The section of general surgery, the parent stem from which the subsection of the surgical services, A. E. F., were subsequent offshoots, came into existence upon the appointment of a director of general surgery, November 10, 1917. On December 22, 1917, two assistants to the director were appointed, and on January 28, 1918, a joint office for administrative purposes was opened in Neufchateau, with the directors of the "divisions" of orthopedic surgery, psychiatry, and genitourinary surgery.

^a The statements of fact appearing herein are based on "Report of the activities of the division of general surgery, A. E. F.," by Brig. Gen. J. M. T. Finney, M. C., chief consultant, surgical services, A. E. F. The report is on file in the Historical Division, Surgeon General's Office, Washington, D. C.—*Ed.*

The section of general surgery, being independent at the time in question, as was true of the other professional services, reported directly to the chief surgeon, A. E. F. Pursuant to General Orders, No. 88, general headquarters, A. E. F., June 8, 1918, the various professional services were coordinated under a director of professional services, and the director of the surgical services now became the chief consultant thereof, with the following subdivisions, each in charge of a senior consultant, directly under him: roentgenology; surgical research; neurological surgery; orthopedic surgery; ear, nose, and throat surgery; general surgery; venereal and skin diseases and genitourinary surgery; maxillofacial surgery; ophthalmology.

SURGICAL CONSULTANTS WITH TACTICAL UNITS

The first step taken was the recommendation that a surgical consultant be appointed by the director of surgical services, following his appointment in November, 1917, for each of the tactical divisions then in France. After their appointment, these officers met the medical officers of the divisions and advised with and instructed them. When the tactical divisions went into the front line the services of the divisional surgical consultants proved to be more valuable in the hospitals, and thereafter their time was chiefly spent in the evacuation hospitals. Consultants to our divisions operating in French armies occupied their time chiefly in observing the methods and treatment in French hospitals.

There was in the beginning (in each division) a decided tendency to do surgery in the field hospitals. The chief consultant in surgery received an order from the chief surgeon, A. E. F., forbidding operations in a field hospital when an evacuation hospital was available. This made it possible to place consultants with mobile and evacuation hospitals only.

As the surgery was now all done in hospitals, other than divisional, save in unusual circumstances, it soon became apparent that consultants were not needed with divisions; therefore a consultant and assistant were then designated for each corps. This new arrangement was satisfactory until the First Army was formed, when the same objections obtained as to consultants with corps as proved true of divisions. A consultant for each army was then appointed, with a sufficient number of assistants, to supervise the surgical work in all the evacuation and mobile hospitals. This policy was put in operation in both the First and Second Armies and proved fairly satisfactory. Corps surgeons were almost unanimous in the opinion that no consultants were needed with divisions or corps.

SURGICAL TEAMS

Another important step, after securing the assignment of consultants to tactical units, was the organization of surgical teams from the personnel of all base hospitals. This was initiated on January 7, 1918. Each team consisted of 1 operator and assistant anesthetist, 2 nurses, and 2 orderlies. A dozen teams were quickly organized, and others as more hospital units arrived, so that by the end of October some three hundred teams had been organized and two hundred were operating with the First and Second Armies.

THE PREOPERATIVE TRAIN

Another improvement instituted by the chief consultant, surgical services, was the "preoperative train"—a train filled with certain (unoperated) cases, which would not suffer from transportation and a delay of 29 to 36 hours. During the St. Mihiel operation the chief surgeon, First Army, was furnished a list of the type of cases suitable and the plan was put in practice, thus relieving the forward hospitals of many cases. No bad results followed except in a few instances where trains were sent to more distant hospitals.

SURGICAL CONSULTANTS, HOSPITAL CENTERS

The necessity for surgical consultants in the large hospital centers was apparent to the chief consultant for a long time; however, through lack of personnel, they could not be supplied until toward the end of active hostilities. At the end of 1918, 16 hospital centers had surgical consultants.

EXPERIMENTAL WORK

Early in January, 1918, a committee was appointed by the chief consultant in surgery to study the best methods of blood transfusion for use in the forward area. An excellent report was prepared and distributed to the medical officers. Instruction in the treatment of shock was given at the central laboratory, Dijon. Experimental work in connection with the problems of wounds of the thorax also was done. The chief consultant suggested an interchange of personnel between base and mobile hospitals and this plan was partly carried out.

LECTURES

In addition to the activities directly connected with the treatment of the wounded, the senior consultants of the subsections and the consultants with troops and hospital centers gave lectures at the Army sanitary school, Langres, on surgical subjects connected with their various departments.

NEUROLOGICAL SURGERY ^b

A senior consultant in neurological surgery was appointed on June 7, 1918, and directed to organize a subsection. His problem was unique since no precedent existed in any army. A rough estimate by him made it seem probable that 25 per cent of all casualties would present neurological problems; unofficial figures from British and French sources gave the following percentage of nerve injuries: Wounds of the head, 16 per cent of all wounds; wounds of the spine, 2 per cent of all wounds; wounds of major peripheral nerves, 20 per cent of all serious wounds of the extremities.

The problem presented two aspects: The immediate care, in forward hospitals, of the more serious cranial and spinal cases; later care at base hospitals of residual paralysis of peripheral nerves. The results at that time in both cases were not encouraging; over 50 per cent of penetrating skull wounds

^b The statements of fact appearing herein are based on "Report to the chief surgeon, A. E. F., from the senior consultant in neurological surgery, dated Neufchateau, Dec. 2, 1918, on summary of the activities of the department." Copy on file, Historical Division, S. G. O.—Ed.

and 80 per cent of the spine were fatal. The wounds of peripheral nerves were simply accumulating and awaiting treatment later.

The plan of organization provided for teams for hospitals in the zone of the advance; representatives in the base hospitals; neurological centers.

For each team, one surgeon from each evacuation hospital was selected, given special instructions and assigned to this work in his hospital; also proper equipment was supplied. A difficulty was that in "centers" devoted exclusively to diseases and injuries of the nervous system, as in the French Service, on emergency these surgeons were often impressed for general work. Another difficulty, in a rush period, was the slowness of head operations. Often the tedious head cases were passed on to base hospitals that more cases might be handled. Through June, 1918, there were teams only at Mobile Hospitals Nos. 1 and 2; by July most of the evacuation and mobile hospitals had such teams. Following this, more specialists arrived from the United States and more instruments were available; so that, before the St. Mihiel operation in September, each hospital in the forward area had an experienced team. Although this operation was relatively short, it was seen that one team in each hospital was not sufficient to screen out the cases; in some hospitals the teams were off duty or doing general surgery, and the results were not satisfactory. Fifty per cent of head cases died, exclusive of those dying later in base hospitals.

In preparation for the Meuse-Argonne operation, the senior consultant, neurological surgery, urged the chief surgeon to supply two teams to each hospital on the main line of evacuation—Fleury, Souilly, and Villers-Dancourt; and to direct that field hospitals route suitable cases to one of these points. Instead, the British plan was followed; one hospital at Deuwnouds, was selected, and several teams concentrated there. Some 813 cases were secondarily routed to this hospital, whose location and general arrangements were poor. Because of these conditions and the changing personnel results were not entirely satisfactory, resulting in the adoption of the former plan, that is having special hospitals, farther forward, as named above. From 50 to 100 beds were set aside for these cases at each of the three hospitals.

As to wounds of peripheral nerves little more could be done in the advance hospitals than to prevent the destruction of nerves by extensive débridement, and to have some divided nerves sutured. This latter procedure was necessarily rare. These cases were generally handled in the base hospitals, where provision was made as far as possible, for a specialist at each.

As a rule each hospital group, a center, had one selected hospital to which proper cases were to be sent, either on arrival or later.

It was the intention to have a group of well-trained neurologists and neurosurgeons for each of the large centers and this plan was put in operation at some centers, as, Bazoilles, and Contrexeville. Military Hospital No. 1 served for the Paris group. Owing to lack of suitable personnel and to the difficulties of secondary routing, the project of a district neurological center had to be abandoned; though Base Hospital No. 115, at Vichy, made a very successful start in that direction.

ORTHOPEDIC SURGERY ^c

The orthopedic service began with the dispatch to England of an orthopedic surgeon and 20 assistants in May, 1917. These officers were assigned to duty at different orthopedic centers there pending the organization of the American Expeditionary Forces.

The subject of splinting was taken up in July, 1917, and a committee was appointed by the chief surgeon, A. E. F., for the purpose of formulating regulations for the standardization of splints. This committee recommended a set of splints, which were adopted, and described in the Manual of Splints and Appliances for the Medical Department of the United States Army, 1917.

More orthopedic personnel was now arranged for, and in October, 1917, 45 orthopedic surgeons, with 3 Sanitary Corps officers trained for splint shop work and 12 special nurses, sailed from the United States for England. All this personnel was assigned (temporarily) to the British Service, partly for instruction and partly to assist the British Medical Service.

In November, 1917, a director of orthopedic surgery and two assistants were appointed. The director and one assistant were stationed at Neufchateau, the other assistant was stationed in London as liaison officer with the British Medical Service.

Shortly after this time, our troops occupying training areas, the orthopedic problems were chiefly static defects, such as flat feet, weak back and knees, among line troops. To correct these static defects, a special training battalion was established in the 26th Division, then at Harechamp, where the men were trained to correct faulty habits of posture while on a duty status. This battalion was successful and was later transferred to the First Depot Division at St. Aignan-Noyers. By July, 1918, the need for class C men—that is, men unfit for front line duty—was so great and the number of the men mentioned so great and instead of attempting to make them fit for class A they were given short periods of training and assigned directly to class C duty. In this manner, at one time, 1,200 men were assigned to the Hospital Corps, 1,000 at another time, 1,000 for prison guard duty, 100 for military police, and others in smaller groups.

In November, 1918, a number of our orthopedic surgeons were withdrawn from service in England and assigned to combat divisions in the American Expeditionary Forces for the purpose of training Medical Department officers and men in the proper application of splints. At first three such orthopedists were assigned to each division for this purpose. In addition they made a survey of the entire personnel, and as far as possible, corrected defects of this. Later, when the divisions entered combat, training in the application of splints became a principal feature of the orthopedic section. Divisional arrangements for the transportation, storage, and handling of splints were also in the hands of the orthopedic surgeon.

Supervision of bone and joint cases was given to the orthopedic section. To accomplish this, one of the assistants to the chief consultant was assigned to

^c The statements of fact appearing herein are based on "Report of the senior consultant, orthopedic surgery, on the activities of the department of orthopedic surgery, made to the chief surgeon, A. E. F." On file, Historical Division, S. G. O.—Ed.

the zone of the advance and another to the hospitals in the rear; supervision of the work in the combat divisions was given to a third. In addition to these, special consultants were assigned to various groups, to centers, and hospitals.

In order to care properly for the bone and joint cases, standardized methods were announced and taught: First, splinting; second, transportation; third, posture of limb injured. This standardization did away with the unnecessary changing of splints and the possible harmful changes of methods of treatment. "Splint teams" were organized, each consisting of one orthopedic surgeon and two enlisted men. These teams took charge of the wounded man as soon as his operation was completed, applied the necessary splints, and cared for him (if retained in hospital at the front) or supervised his transport to the rear.

Groups of reconstruction aids were also employed for giving physical therapy to the men in base hospitals; curative workshops were established.

The work of the orthopedic service demonstrated, first, that a large number of physically unfit men can be restored to duty by proper training, and that many such conditions as flat-foot and weak back should not be carried on the sick report as sickness, but should be considered simply as weakness, to be corrected by training; second, the use of standard methods of splinting, transportation, and after treatment, reduced the mortality rate among combat casualties and greatly reduced the amount of their later impaired functions.

ROENTGENOLOGY ^d

The personnel of this department consisted of medical officers expert in X-ray work; officers of the Sanitary Corps, called technicians; enlisted men of the Medical Department. They arrived in France as members of hospital units or as casuals. Though some of the officers proved to have had little or no actual experience in this line of work, a large percentage of them had received an intensive course of training in the United States, and so arrived in France with a general knowledge of the physics underlying X-ray work and with the construction and operation of the various types of X-ray machines being used. Additional instruction was given in France, at first, at the X-ray repair shop in Paris, and later at a school established at the hospital center, Bazoilles. Several groups were instructed at Tours by a medical officer of the French Army.

The installation and repair of apparatus was done by 12 officers of the Sanitary Corps. The care and routine work was done by enlisted men, known as manipulators. As a rule, these enlisted men were trained in the United States, though some were trained in France.

The X-ray apparatus used in the hospitals in the American Expeditionary Forces was similar to that used in military hospitals of the United States. The large interrupterless type of machine was not suited to French conditions on account of the current supplied; only bedside units and modified bedside transformers were found suitable. At some places no current was available, requiring the use of a gas engine. One bedside unit was found to be needed for each 500 beds. This apparatus could be operated on practically any type

^d The statements of fact appearing herein are based on "Report of the activities of the Roentgenological service A. E. F., by the senior consultant, roentgenology." On file, Historical Division S. G. O.—Ed.

of current and used so little current that it could be attached to an electric light plug. The Army portable outfit was found very satisfactory for base hospital use.

Mobile hospitals were supplied with an X-ray motor truck of French manufacture, which had a number of faults and disadvantages. A camion devised in America was much superior, but did not arrive in the American Expeditionary Forces until toward the end of hostilities.

X-ray work was done in all the army zones and sections. At the front practically all battle casualties were examined in evacuation, mobile, and fixed field hospitals; fractures were briefly described, foreign bodies located, and evidence in chest wounds was recorded. X-ray work during an operation was but seldom necessary. The combat divisions did not need X-ray apparatus. The proportion of patients X-rayed was 80 per cent in the field hospitals for nontransferable cases and 90 to 95 per cent in evacuation and mobile hospitals. To keep up with the work in times of emergency it was necessary to employ two shifts and work continuously.

The base hospitals also employed the X ray extensively, especially in care of wounded coming directly from the front.

MAXILLOFACIAL SURGERY ^c

On April 18, there arrived at Brest a party consisting of 19 medical officers, expert in oral and plastic surgery, and 15 special dental surgeons. Pending active operations by the American troops, these officers were scheduled for assignment, some to a French hospital at Lyons and the remainder to British hospitals at Croydon and Sidcup, England. The officers intended for Lyons, however, were delayed and were assigned to a British hospital instead. Other officers were assigned to Evacuation Hospital No. 1, Base Hospital No. 15, and American Red Cross Hospital No. 1. Those who had been sent to allied hospitals were gradually withdrawn for general surgical and dental work, to be reassigned to their own specialty when needed.

In authorizing the establishment of the maxillofacial service the chief surgeon, A. E. F., directed that it be conducted as a part of the general surgical service, but in such a manner as to receive the cooperation of the dental service in the most efficient manner. The chief consultant, surgical service, the chief dental surgeon, and the senior consultant of the maxillofacial service were in accord as to the advisability of this plan. The general plan outlined specified that the maxillary and facial cases should be in charge of a surgeon working in cooperation with a dental surgeon. It was believed that if these cases could receive proper treatment in the advanced hospitals, and this treatment continued in the base hospitals, they could be saved (except in a few cases with great loss of time) from the reconstruction class and made fit for duty within the time cases were allowed retained in the American Expeditionary Forces. Further, that with proper care reconstruction would be simpler and more successful. Experience proved this view to be correct.

^c The statements of fact appearing herein are based on "Report of the senior consultant, maxillofacial surgery, on the activities of the maxillofacial service, A. E. F., made to the chief surgeon, A. E. F." On file, Historical Division, S. G. O.—Ed.

As planned in the office of the Surgeon General, each evacuation hospital was to have one surgeon and one dental surgeon for this special work. No provision was made for mobile and American Red Cross hospitals.

It was soon learned that it was best not to designate these specialists for the various hospitals by specific orders, but rather by individual understanding with the various commanding officers, who were requested to assign the most desirable officers of their personnel. The lack of special surgeons was later compensated for by the appointment of local consultants.

In each base and evacuation hospital a specially qualified dental surgeon was assigned to care for prosthetic and splint work. Unfortunately, not all the mobile hospitals were so equipped, even at the signing of the armistice, and, in a number of cases these dental surgeons were handicapped by having other duties assigned them, such as those of evacuation officers and mess officers.

On June 11, 1918, the senior consultant, maxillofacial surgery, made recommendation as to a definite plan of early treatment. This plan was authorized by the chief surgeon, A. E. F., in a memorandum issued in October. Instructions were also issued by him covering the evacuation and transportation of maxillofacial cases. It was directed that such cases, evacuated to the Paris district, be treated in American Red Cross Hospital No. 1; other cases that could be were to be transferred to any hospital having this special service, or to Base Hospital No. 115. Base Hospital No. 115 had been designated as a special hospital for surgery of the head. While there was much general surgery done there, there were more special facilities for maxillofacial surgery, such as expert modelers in wax reproductions, expert surgeons and dentists, and special supplies. With all the above facilities, however, the contemplated plan of making the repair of the soft parts in extensive injuries before return to the States was practicable in but few instances.

In September, a number of local consultants were appointed. One was assigned as local consultant, advance section, and also as assistant to the senior consultant. Local consultants were assigned as follows: Base sections Nos. 1 and 5, station at Savenay; base section No. 2, station at Beau Desert hospital center; area 3 (Toul, Bazoilles, Vittel, Chaumont, Rimaucourt, and Langres), station at Toul; area 4 (Dijon, Allerey, Beaune, Mars, and Mesves), station at Beaune; area 5 (Vichy group), station at Vichy; area 6 (Tours and Orleans), station at Tours; Paris area.

Though the senior consultant remained in America until the special equipment needed was ready for shipment, with the exception of one intratracheal vaporizer, a few sets of oral and plastic instruments, and 500 emergency jaw splints, none of this equipment had been received when the armistice was signed. This shortage was partly compensated for by the collection and having made of special jaw splinting material and by ingenuity in extemporizing material.

To sum up, the work done by the service included: (1) The training of a number of surgeons and dental surgeons in the work to be done, both in special schools and in French and British hospitals; (2) the organization of the work in the American Expeditionary Forces. This included the general organization, the appointment of local consultants, and the development of centers.

In so far as the American Expeditionary Forces are concerned the results obtained in maxillofacial surgery were not as great in quantity as had been

anticipated, owing to the lack of both personnel and equipment, the utilization of some of the personnel for other work, and the relative brevity of the period of active hostilities.

VENEREAL AND SKIN DISEASES AND GENITOURINARY SURGERY ^f

Four members of the Medical Corps reported to the British Army in England on June 8, 1917, for the purpose of studying the British methods of treating venereal diseases. A month was devoted to this study in England and in the British Expeditionary Forces, France. Numerous hospitals in England and in France were visited, and the routing of venereal cases from organization to hospital was studied. A second month was then spent in the study of methods employed in French military hospitals, two of the medical officers referred to making, in addition, an extended tour, accompanied by a senior French medical officer, of several French armies with the view of observing the sanitary organizations.

As regards the British Army, it was found that, during the year 1916, 112,249 cases of venereal disease were treated in hospital. Of these cases, 52,495 were treated in 14 hospitals in England and 59,754 in 5 British Expeditionary Force hospitals in France. The capacity of the hospitals in England varied from 100 to 1,500 beds, and of the British Expeditionary Force hospitals from 500 to 3,500. The largest hospital—that is, 3,500-bed capacity—had treated 55,634 patients with venereal disease, including 12,000 syphilitics. During the years 1915–16 the hospital referred to had treated 22,596 cases of gonorrhea, representing 1,082,621 days lost in hospital, or an average of 48 days each. Sixty per cent of the gonorrhea cases had complications, usually prostaticitis or epididymitis; 17 per cent were readmissions for relapses of the disease after supposedly having been cured. In addition to the days lost in hospital, the patients lost from one to two weeks in traveling to and from hospital.

In respect to the French Army no statistics were obtainable by the medical officers studying the venereal situation therein, as to the prevalence of venereal disease, partly owing to the fact that uncomplicated gonorrhea had been treated habitually by the French in regimental organizations. It had been estimated by the French, however, that up to the end of the year 1916 there had been 200,000 cases of syphilis in the French Army. These syphilitics were treated in approximately 20 hospitals, the bed capacity of which varied from 100 to 800, each patient remaining in hospital from 4 to 7 weeks. The French practice was to establish throughout the country centers for the treatment of skin and venereal diseases, where both civil and military patients received dispensary and bed treatment, as the case might call for.

As a result of this investigation, the officer who was subsequently to become the senior consultant in skin and venereal diseases, as well as in genitourinary surgery, concluded that the established system of transferring venereal patients from their organizations to hospitals situated from 50 to 100 miles removed was not the best method, and that such venereal diseases as might arise in the American Expeditionary Forces could be treated fully as efficiently in the

^f The statements of fact appearing herein are based on "Report of the division of urology, A. E. F.," by Col. Hugh H. Young, M. C., senior consultant in venereal and skin diseases and genitourinary surgery, Dec. 20, 1918. On file, Historical Division, S. G. O.—*Ed.*

organizations to which the patients concerned belonged. This latter method had the following advantages: (a) Saving of time lost in the transfer of patient to and from hospital. (b) More efficient treatment. Treatment of venereal patients in their organizations permitted better control and continuity, especially as regards syphilis. (c) Saving in personnel and material by eliminating large base hospitals for the treatment of venereal diseases.

The treatment of venereal diseases in the organizations to which they belonged, then, became the established procedure in the American Expeditionary Forces. To facilitate this, a regimental infirmary urological set was adopted and a supply of them was ordered for the American Expeditionary Forces, delivery being made to the forces in January, 1918, and subsequently. Also, a proper stock of drugs for the treatment of venereal diseases was ordered; the injection treatment of syphilis was standardized; a condensed, one-page syphilitic register was devised and placed in use; special ampoule syringes containing gray oil, and ampoules of novarsenobenzol, of sterilized distilled water, and of cyanide of mercury were designed and supplied for the treatment of syphilis. Diagnostic facilities in the examination of blood smears, for the Wassermann reaction, the examination of urethral smears, were established through collaboration with the director of laboratories, A. E. F. Owing to the lack of suitable equipment in the field, the Fontana and Hollande stains were adopted for the detection of spirocheta in the field, the dark field illumination being reserved for employment in laboratories established at central points and at base hospitals. Individual prophylactic tubes for the prevention of venereal disease were devised and supplied for the use of those who did not have ready access to prophylactic stations, such as small detachments at remote stations.

A beginning was made, at the instance of the senior consultant in urology, to minimize the venereal infectiousness of the civil population of France. A hospital was established by the American Red Cross at Neufchateau, with a subsidiary hospital at Doulaincourt. From these places teams, each consisting of a medical officer and a nurse, would make daily visits to surrounding towns to establish clinics for the treatment of venereal diseases among the civil population. Six routes were established covering 50 clinics in an area radiating fully 50 miles in all directions from Neufchateau. The hospital, constructed for the purpose at Neufchateau, was completed on March 15, 1918. It contained 50 beds and had operating room and laboratory facilities.

To insure the systematic treatment of venereal diseases in the American Expeditionary Forces, urologists at base hospitals were instructed as to the methods to be employed, and specially qualified urologists were, after a preliminary course of training, appointed as urologists in each tactical division and in each base port.

In so far as the tactical divisions were concerned, the established system of treating all venereal cases in their organizations operated satisfactorily until these divisions began to take their places in the front line. Because many commands then became so broken up with working parties as to make it practically impossible for regimental medical officers to keep constantly in touch with venereal cases, who, in many instances were at work at distances varying from 5 to 10 miles from the nearest medical officer, it was necessary

to modify the organization for treatment. Accordingly, working camps now were established in connection with divisions at the front, wherein were collected all venereal disease cases in the division concerned. It proved that approximately three-fourths of such venereal disease cases thus could be kept on a duty status and supplied for working parties, under the direction of the divisional quartermaster or engineer officer.

As to the location of the working camps for venereal cases, a tryout of several schemes proved that such a camp could functionate best if established in one of the divisional field hospitals. Therefore, the accepted practice was to establish such a camp in conjunction with a divisional field hospital given over to the treatment of venereal and skin diseases.

Venereal camps were established not only in connection with tactical divisions but also at depot divisions, and on the same principles as obtained in the combat divisions. In the depot divisions the venereal camps were used for venereal cases sifted out from the replacement troops, thus preventing them from becoming a burden to the tactical organizations at the front.

One of the final uses to which venereal camps were put was in connection with home-going troops following the signing of the armistice. In this connection, it was required that all members of the American Expeditionary Forces returning to the United States were to be examined for venereal disease prior to embarkation, and that those found venereally infectious were to be detained and placed in segregation camps.

A manual of military urology was prepared under the direction of the senior consultant in urology and was distributed to medical officers of the American Expeditionary Forces. This manual comprised sections on venereal diseases, dermatology, and surgery of urinary and male genitalia. Also, it contained appendices giving in full all promulgations concerning the subject of venereal diseases and alcoholism both in the United States and in the American Expeditionary Forces, and the French regulations on prostitution and alcoholism.

Concerning the problems connected with dermatology in the American Expeditionary Forces, after an extensive study of the conditions in reference to scabies and lousiness in both the American Expeditionary Forces and those of our Allies, the plan of action decided upon was as follows: (a) Instructions were prepared which appeared from time to time either as general orders, headquarters, A. E. F., or as circulars from the chief surgeon's office, A. E. F. (b) Divisional and other urologists were especially instructed in the measures for the prevention, diagnosis, and treatment of these diseases. (c) Specially qualified dermatologists were constantly in the field inspecting pertinent conditions and in giving instructions on these topics. (d) Scabies hospitals were established in connection with the divisional venereal camps. (e) Regional disinfestation, rather than divisional. (f) Observance of the principles of the prevention and treatment of skin diseases as outlined in the Manual of Military Urology.

Though it was planned having special hospitals wherein cases requiring genitourinary surgery could be given special treatment, this was found to be impracticable in view of the fact that such injuries or conditions were so relatively scattered and few in number.

SURGICAL RESEARCH⁹

The section of surgical research of the surgical services, A. E. F., comprised a senior consultant and three consultants, with the necessary assistants. The work of the senior consultant was done at Base Hospital No. 4, which operated with the British Expeditionary Force at Rouen, and in collaboration with several officers in his laboratories in Cleveland; one of the consultants carried on his investigations at Base Hospital No. 10, also operating with the British Expeditionary Force at Treport; the remaining two consultants established a surgical research laboratory in connection with the central Medical Department laboratory, Dijon.

It was under the broad interpretation of research as including anything that would offer promise of yielding useful information that the work, much of which was done in the British service before our forces became actively engaged at the front, was made possible.

A program of work was planned by the senior consultant and in hand on November 11, 1917, which was contemplated for the following winter months of anticipated light military activity. It was during this relatively inactive surgical period that the researches included not only general surgical subjects but also subjects of interest to both the combatant and the medical arms. The latter researches were made in collaboration with the British Royal Engineers' training school, Rouen; however, during periods of active warfare these studies were dropped and subjects of immediate surgical bearing were taken up. The following list will indicate the wide range of subjects thus investigated: (1) Phosgene poisoning, clinical and experimental; (2) biologic test of safe and danger points in gas defense works; (3) research into carbon monoxide poisoning; (4) research into psychic effect of minor explosives; (5) further research into the effects of high explosives; (6) research into the effects of various infusions; (7) the inceptive stage of shock; (8) research into the effects of hypertonic salines.

The following researches into practical surgical problems were made: (1) Organization of resuscitation teams with the British Expeditionary Force, France; (2) slightly wounded; (3) delayed infected wounds; (4) on blood transfusion; (5) shock and hemorrhage; (6) treatment of infections; (7) chemical antiseptics; (8) delayed closure of wounds; (9) surgery of the chest; (10) study of types of wound that bear transportation.

Apparatus was secured from the United States, and the central Medical Department laboratory cooperated in every way; the American Red Cross gave grants of money freely for supplies and sundry expenses. The Research Society of the American Red Cross provided excellent opportunity for cooperation with similar services in the British, French, and Italian Armies.

The plan for the laboratory which was necessary for the various researches projected was perfected in January, 1918, and in April the laboratory was established at Dijon. Here investigations were begun in May. The principal work of this laboratory was along two lines: First, treatment of wounds of the chest, and, second, shock and hemorrhage. The results accomplished appear in Vol-

⁹ The statements of fact appearing herein are based on "Report of the activities of the division of surgical research, A. E. F.," made Dec. 18, 1918, by Col. G. W. Crile, M. C., senior consultant in surgical research, A. E. F. On file, Historical Division, S. G. O.—*Ed.*

ume XI, Part I. At this time it is only necessary to say that the treatment of chest wounds was largely standardized, and by the organization of transfusion and shock teams undoubtedly many lives were saved. The use of Bayliss' solution of gum acacia as a substitute for transfusion was an important demonstration; another was that of a measure of the degree of anemia requiring transfusion.

OTOLARYNGOLOGY ^h

When the senior consultant of otolaryngology was designated in June, 1918, there were 17 base hospitals actively functioning, with one otolaryngologist on duty in each. There were already 50 camp hospitals established, 50 per cent of which were not functioning. Of those which were active less than one-third had an otolaryngologist assigned to them. The total roster of otolaryngologists at that time was 32.

One-third of the base hospitals operating at the time were lacking in otolaryngological instruments and equipment to care adequately for the patients they were receiving. The senior consultant visited each hospital, inspected the instruments and equipment, and assisted in compiling a list for requisition from the medical supply depot. Plans for an examination and treatment room for ambulatory patients were formed in those hospitals where no provision had been made previously for them and suitable construction was at once begun. Special wards were obtained for this department and where possible specially trained nurses assigned to duty in these wards.

Of the camp hospitals operating only two had sufficient instruments and equipment properly to care for otolaryngological cases.

In only one was an otolaryngologist on duty, with practically no instruments or equipment with which to work. Otolaryngologists subsequently were assigned to all camp hospitals in the order of their needs. Instruments and equipment were obtained and examination and treatment rooms constructed.

None of the mobile hospitals established early had an ear, nose, and throat surgeon connection with them. Officers were assigned to these hospitals as needed and assistance was given to procure instruments and equipment sufficient for the needs of the department.

In none of the field hospitals functioning was there an otolaryngologist or any instruments or equipment for use in this department. Officers were assigned as needed and instruments and equipment procured.

There were eight otolaryngologists on duty with various combat divisions. Later the number was increased as requests were made, but at no time during active military operations were there sufficient officers from this department to meet the demands made upon it.

At hospital centers a set of buildings was assigned to this department so that all the work in the center could be accomplished at the one place. Special wards and operating rooms were arranged and large examination and treatment rooms for ambulatory patients fitted up, and a staff composed of officers from the base hospital units of the center was formed. This obviated redupli-

^h The statements of fact appearing herein are based on "Report of the activities of the ear, nose, and throat service A. E. F.," made by Col. James T. McKernon, M. C., senior consultant, ear, nose, and throat surgery, A. E. F. On file, Historical Division, S. G. O.—Ed.

cation of instruments and equipment and resulted in a better care for the patients, besides allowing the excess officers in the department to be made available for duty elsewhere.

At all the large hospital centers a consultant in otolaryngology was appointed whose duty was to supervise generally the work in the center and to act as consultant when called upon by the center otolaryngologist or the individual units. This arrangement proved most satisfactory, resulting in a better care for the patients as well as maintaining a more rigid discipline for the staffs of the center.

The senior consultant visited all the hospitals, many times seeing cases in consultation, operating when necessary, and consulted as to the needs of the service with both the local otolaryngologist and the commanding officer of the hospital. Many visits were made to evacuation, mobile, and field hospitals in consultation during which advice was given as to the care and routing of the otolaryngological cases; and later following up such cases as had been routed to base hospitals in the rear, consulting as to the nature and amount of reparative work to be done on them.

In December, 1918, there were 238 officers on active duty in this department, and 12 others being held in reserve for future duty with the Third Army, when needed.

OPHTHALMOLOGYⁱ

The senior consultant in ophthalmology was appointed in June, 1918. As the service developed, an assistant was added to the office, Neufchateau, and in September, 1918, another.

Each base hospital unit arriving in France had one or more expert ophthalmologists. To visit, advise with, and supervise these officers was one of the principal functions of the chief consultant. Some of the clinics were well equipped (for example, that of Base Hospital No. 36 of the Vittel-Contrexeville hospital center); others were not. Base Hospital No. 36 served as a special ophthalmological hospital for the Vittel-Contrexeville center. Camp hospitals, as a rule, sent all important cases to the nearest base hospital.

Gradually local consultants were supplied to the principal hospital centers and base areas.

One of the striking features of the subsection was the base optical unit, which arrived in France May 4, 1918. This unit had a strength of 1 officer and 69 men. The equipment, stock, and machinery (amounting to nearly 19 tons in weight) was delayed, but part of it reached Paris in July. Shortly after the arrival of the unit, eight auxiliary units were organized and assigned to various base hospitals; later, seven other units were made up and likewise assigned.

The shop was located first at Neuilly, but later it was removed to Port St. Cloud. It began operating July 27, 1918, and was in full operation by October 1. The equipment was sufficient for the production of 100 pairs of glasses per day. From July 27 to December 1, 1918, the production was as follows: 21,828 prescription jobs; 3,091 smoked spectacles; 1,620 repair jobs.

ⁱ The statements of fact appearing herein are based on "Report of the activities of the ophthalmological services, A. E. F.," by Lieut. Col. Allen Greenwood, M. C., senior consultant, ophthalmology, A. E. F. On file, Historical Division, S. G. O.—Ed.

On account of the unusual amount of work to be done, a full day and night force was in operation in the shop. A special attachment was devised to supply the demand for prescription lenses in gas masks. The unit had men and machinery sufficient to handle all work received, but could never get sufficient supplies or material.

Artificial eyes were also supplied as needed; 1,000 were taken to France with the unit and 700 were received later. Large stocks were kept at a few places and at the base ports.

The totally blind were given preliminary training at Paris, Savenay, and Vichy, before being returned to the United States.

An important feature of ophthalmic surgery was the giant magnet. A supply of magnets, shipped to France early in 1918, was lost for a long time. When finally found, magnets were placed in two of the forward evacuation hospitals and in base hospitals at Chaumont, Bazoilles, and Vittel. American Red Cross Hospital No. 1, at Paris, was also supplied. As no more magnets arrived, work was begun on the building of giant magnets at the Medical Department repair shop in Paris, and five were turned out. Somewhat later some medium-sized and small magnets arrived from the United States, and with them it was possible to equip all hospitals necessary.

A trachoma survey was made of the labor organizations, A. E. F.; 12,461 laborers were examined and 261 cases found. Means were suggested for handling this problem.

Circulars of instruction were issued on such subjects as gassed eyes, injuries, refraction, pterygia, strabismus, wounds of the eyelids and orbits, artificial eyes, trachoma, and plastic work.

MEDICAL SERVICES ⁱ

The chief consultant, medical services, A. E. F., entered upon his duties November 9, 1917. The fact that, at the time, the chief consultant was designated "director," has been explained above, and need not be gone into further here.

With the sudden and great expansion of the Army in 1917-18, the greater part of the Regular Medical Corps was required for administrative work, leaving the professional practice of medicine and surgery almost entirely to temporary medical officers. Of this great body of new officers, generally unknown to their commanders, lay the responsibility of the actual care of the sick and wounded in the American Expeditionary Forces. On the proper selection and supervision of this ever-increasing class of officers depended very largely the cure and restoration to duty of the many thousands of sick and wounded of the Army. The efficiency of the professional services depended to a marked degree on this factor.

The chief consultant, medical services, understood that he had been selected, in part at least, on account of his general acquaintance with the character and qualifications of the medical profession of the United States, and that his duty was not only to supervise the practice of medicine in the American

ⁱ The statements of fact appearing herein are based on "Report of the activities of the office of the chief consultant, medical services," made December, 1918, by Brig. Gen. W. S. Thayer, M. C., chief consultant, medical services, A. E. F. On file, Historical Division, S. G. O.—Ed.

Expeditionary Forces, but also to furnish the chief surgeon, A. E. F., with such information as to the special qualifications of various new medical officers as might facilitate proper selection and assignments.

On March 12, 1918, a principal assistant to the chief consultant was designated.

A study of medical conditions revealed considerable variations in professional personnel and practices in the various base hospitals, tactical divisions, and formations at the bases along the lines of communication. The need for supervision was clearly seen; but with the multiplicity of organization, widespread territory, and difficulties of transportation, this supervision could not be exercised by one or two officers. Special consultant officers were necessary for special localities, but few were available in France; internists who were suitable could not be spared from their stations. Accordingly, officers were sought in the United States. During April, May, and June, 1918, efforts were made to obtain from America a number of clinicians of recognized ability, who could be utilized as consultants, chiefs of service, or for special research.

The great and increasing need for officers especially qualified in internal medicine led to a cabled request on June 10, 1918, for 50 such officers of the grade of lieutenant or captain; and again, on September 26, for a request for an additional 150.

In April, a consultant, general medicine, was assigned to the advance section and zone of the army; consultants in tuberculosis and in cardiovascular diseases were designated. In June, a consultant in gas poisoning was designated. In July, senior consultants, Air Service, and general medicine were assigned. In the following month, consultants, general medicine, were assigned to base sections Nos. 1, 2, and 115, and to the hospital centers at Bazoilles and Vittel-Contrexeville.

The greater part of the medical officers requested in May did not arrive in France until October, and despite the pressing need for consultants no more designations could be made until their arrival. Beginning with October the following assignments of medical consultants were made: To the hospitals at Rimaucourt and Chaumont; Dijon, Beaune, and Allerey; Mesves; Vichy and Clermont-Ferrand; Paris section; Mars; Orleans and Tours; Justice group, Toul; and to base section No. 5; parts of the intermediate section; base section No. 2.

At the end of October, a consultant for base section No. 3 was designated. After the armistice was signed the consultant, gas poisoning, became consultant to the camp hospitals in the advance section.

With the formation of army corps, consultants were assigned to each. Likewise, when armies were organized consultants were assigned to each.

One of the earliest organizational procedures of the chief consultant, medical services, was the institution of certain medical teams. The need for the preparation of medical officers in the care of surgical shock and in the treatment of men suffering from poisoning by suffocative gases was early apparent, and, in view of the lack of such special training among the medical officers of organizations at the front, special gas and shock teams were organized. The officers of each shock team were habitually required to take the course in treat-

ment of surgical shock given weekly at the central Medical Department laboratory, Dijon. With the onset of open warfare the shock teams, subsequently called emergency medical teams, were in great demand for the treatment of surgical shock.

The emergency medical teams did effective service; however, the employment of them at the front resulted in great hardship in base hospitals at times because of the shortage of medical officers there, and inability to obtain replacements during the absence of these teams.

TUBERCULOSIS ^k

The efforts of the senior consultant in tuberculosis were directed toward the education of the medical personnel of the various hospitals, more particularly base hospitals, of the American Expeditionary Forces, in the early recognition of pulmonary tuberculosis, the investigation of the pervalence of tuberculosis in the American Expeditionary Forces, and methods for its control.

Following the careful examination of the troops of the Army in the United States and the exclusion of the manifest cases of pulmonary tuberculosis there, the incidence of such cases in the American Expeditionary Forces was expected to be low. However, despite this care in elimination, approximately 2,000 cases diagnosed pulmonary tuberculosis were transferred from the American Expeditionary Forces to the United States prior to December 31, 1918. Of these over 80 per cent had sputum positive for tubercle bacilli. For the same period—that is, up to the end of 1918—there were 250 deaths from pulmonary tuberculosis among our troops in France. Unofficial reports from the French Army, subsequently proving erroneous, had led to a fear in our Medical Department, A. E. F., that there would be a greater development of tuberculosis among the American Expeditionary Forces. The causes which underlay the mistakes in the French Army also were found to obtain in the American Expeditionary Forces; that is, delayed convalescence from pneumonia, bronchopneumonia, the bronchitides—especially those combined with nasal sinus conditions.

In January and February, 1918, it was noted in the Surgeon General's Office that of the men being returned to the United States from France over 50 per cent failed to show positive evidence of the tuberculosis for which they had been sent home. This situation was very easily and effectively remedied by the senior consultant for tuberculosis as follows: (a) A change in nomenclature; that is to say, only cases showing tubercle bacilli in the sputum were now to be diagnosed frankly as pulmonary tuberculosis; all others were to be diagnosed "tuberculosis, observative," (b) The establishment of three centers where these cases could be more expertly studied, namely, Base Hospital No. 8, Savenay; Base Hospital No. 20, Chatel Guyon; Base Hospital No. 3, Vauclair. (c) Visiting frequently the base hospitals to standardize the diagnosis of the disease from the clinical, roentgenological, and laboratory viewpoints. (d) Promulgating data, concerning these matters, to chiefs of medical services and to medical officers who were registered as preferring tuberculosis work.

^k The statements of fact appearing herein are based on "Report of the activities of the senior consultant for tuberculosis," made Dec. 18, 1918, by Lieut. Col. Gerald B. Webb, M. C., senior consultant for tuberculosis, A. E. F. On file, Historical Division, S. G. O.—*Ed.*

As regards treatment, all patients suspected of having, or actually having, tuberculosis and sent to any of the three hospitals mentioned above received excellent care. Those with fever were kept at rest, the temperature and pulse being carefully studied. Sputa were examined frequently, from 10 to 15 times before a given case would be declared negative; when time permitted, concentration methods were practiced in laboratories.

Patients found to be tuberculous were returned to the United States, their physical conditions permitting; others were given graded exercises, first in hospital and later in a convalescent camp, and restored to duty.

PSYCHIATRY¹

Psychiatry was established as a professional division in the American Expeditionary Forces in November, 1917, with a director. Subsequently, however, it was subordinated to the medical portion of the professional services, the director then becoming senior consultant. On his nomination, a specially qualified body of officers was assigned as division, army, hospital group, and section psychiatrists. These officers, under the guidance of the senior consultant, did valuable work in detecting early and treating wisely the psychoses common to armies in the field.

A neurological hospital, Base Hospital No. 117, was established at La Fauche, where patients with war neuroses were sent from army neurological hospitals and all base hospitals in the American Expeditionary Forces. The psychiatric department of Base Hospital No. 116, Bazoilles, was made to serve as a collecting station for mental cases from the tactical divisions and from hospitals in the advance section. Neuropsychiatric departments were established in base hospitals at both the Mars and Allerey hospital centers, at the base ports, and in Paris section.

The problems arising in the front areas in relation to the provisions for the care and disposition of patients suffering from disorders of the mind and nervous system can best be considered under two general heads: Conditions which occurred during periods of relative military quiet, and those occurring during active military operations.

Cases originating in front areas during times of relative quiet comprised men who could be classified in groups exhibiting defective mental development, constitutional psychopathic states, psychoneuroses—*independent of combat experiences*—war neuroses, and, finally, psychoses. These cases were cared for adequately in the divisional hospitals by the divisional neuropsychiatrists in the following manner: All except those with war neuroses were kept under observation sufficiently long to permit making proper diagnoses, whereupon they were transferred to base hospitals especially provided to care for the types of cases under consideration. Patients with war neuroses, which had developed in quiet areas, and when the number of such patients was comparatively small, were successfully treated for the most part in the divisional field hospitals; few required transfer to Base Hospital No. 117, at La Fauche,

¹ The statements of fact appearing herein are based on, (1) "Report of the activities of the section of neuropsychiatry," made by Col. Thomas W. Salmon, M. C., senior consultant, neuropsychiatry; (2) "History of advance neurological formations," made by Lieut. Col. John H. W. Rhein, M. C., consultant in neuropsychiatry, First Army. On file, Historical Division, S. G. O.—Ed.

which, as stated above, was the special hospital for such cases. Those that were transferred to Base Hospital No. 117 were readily transported in motor ambulances, since this hospital was situated sufficiently near to make this possible.

Because war neuroses developed in much larger numbers during periods of active military operations, their management at the front became much more complicated. Our first relatively large experience with such cases occurred during the Aisne defensive. At this time, the plan proposed by the senior consultant, neuropsychiatry, was to have the cases of war neuroses which developed during combat retained in divisional hospitals under the care of divisional neuropsychiatrists for as long a period as possible (not to exceed 10 days or 2 weeks), especially such cases promising that degree of improvement during the period in question as to make it seem possible they could be returned to their organizations on a duty status. On the other hand, cases holding out no such promise were to be evacuated to Base Hospital No. 117, at La Fauche.

In so far as it was possible to do so, division surgeons were consulted with by the consultants in neuropsychiatry who outlined the above plan for dealing with cases of war neuroses incident to combat experiences.

Unfortunately, facilities for caring for such cases in divisional hospitals at the time were inadequate; consequently, the results were on the whole disappointing. Many cases were not retained at all in the divisional hospitals but were evacuated immediately through evacuation hospitals to base hospitals with the general run of sick and wounded. This evacuation naturally tended toward Paris where cases of war neuroses were received in base and camp hospitals in relatively large numbers. Hence they had to be distributed to hospitals farther rearward or to Base Hospital No. 117. Needless to say, the capacity of Base Hospital No. 117 was taxed.

Though the plans went awry, the ultimate results in these cases were satisfactory, for under the care of the neuropsychiatrists attached to the base hospitals and after a short period of rest, patients, in a satisfactorily large percentage, were discharged from hospital to duty.

Of the approximately 200,000 men engaged in the military operations referred to above, the incidence of war neuroses was about 2 per cent of the number engaged and 10 per cent of all casualties. Not only was this number believed to be unnecessarily large but it was also thought by the senior consultant in neuropsychiatry that at least 65 per cent of the men admitted to divisional hospitals for war neuroses could have been returned to duty therefrom within a period of 10 days had suitable equipment for their local care been on hand.

Based upon the above experiences, the senior consultant in neuropsychiatry initiated the establishment of neurological hospitals in the front areas a short distance to the rear of field hospitals. The purpose of these hospitals was to care for men with war neuroses who in all probabilities would be fit for duty within two or three weeks.

For the St. Mihiel operation the plan was as follows: In addition to the divisional neuropsychiatrist, each division was supplied with an assistant neuropsychiatrist. Thus one of these officers could sort cases coming through

the divisional sorting station; the other could treat them in the field hospital. For the cases of war neuroses, which appeared to require more time than the specified time they should be kept in divisional hospitals, neurological hospitals were established, one at Benoit Vaux and another at Toul. These units functioned in an entirely satisfactory manner, thus retaining at the front, after a few days' treatment, many men who otherwise would have been evacuated to the rear.

During the Meuse-Argonne operation, a third such neurological hospital was established at Neubicourt. Over 60 per cent admitted to the neurological hospital at Benoit Vaux were returned to duty within a period averaging 10 to 14 days; approximately 73 per cent of the patients admitted to the neurological hospital at Neubicourt were returned to duty in an average of 10.4 days.

Neuropsychiatrists proved so necessary for expert examination of defectives and of men about to be brought to trial by court-martial, as witnesses during trial, and as experts in the examination of men with alleged self-inflicted wounds, that they were retained throughout the war in the combat divisions. So far as the combat divisions were concerned, this was true of only two other specialties, urology and orthopedic surgery.

COMMUNICABLE DISEASES ^m

Since the section dealing with the communicable diseases was in operation only for three months prior to the end of 1918, many of the plans that were contemplated could not be brought to completion and much of the work of the section necessarily remained fragmentary and unfinished.

A large part of the time was devoted to the hospitalization and professional care of the cases of communicable disease. A considerable number of visits were made, either by special request or by order, to various parts of the American Expeditionary Forces to consult upon diagnosis or the disposition of patients with epidemic diseases or upon individual patients suffering with unusual infections.

Since the hospitalization of the communicable disease cases seemed of immediate and prime importance, visits were paid to many base hospitals and to hospital centers to determine what conditions actually existed and to consult with the commanding officers upon plans for the future hospitalization of these cases. During these visits it seemed obvious, when some sort of segregation of these patients had not been made, that such a method for their care would have to be adopted, and as a rule one of the following methods of segregation was put into operation: (1) The establishment of infectious disease hospitals; (2) the segregation of different classes of cases in different hospitals or in different wards of a single hospital.

For hospital groups the former method seemed preferable for several reasons: It would minimize the danger of spreading infection through the hospital group; it would allow of the proper admission through observation wards of the undiagnosed infections and therefore reduce cross infections:

^m The statements of fact appearing herein are based on "Report of the activities of the section of communicable diseases," made Dec. 21, 1918, by Col. Warfield T. Longcope, M. C., senior consultant in infectious diseases. On file, Historical Division, S. G. O.—*h.d.*

it would allow of a concentration of the personnel especially qualified to care for these particular diseases and therefore would assure better professional treatment; hospital epidemics, such as occurred in the late fall of 1918 in a minor degree with diphtheria, could thereby be immediately recognized; it would simplify administration and save hospital space and beds.

At one hospital center the first plan mentioned above was immediately put into operation. One hospital of the center was selected to care for all the communicable diseases, including influenza and pneumonia. According to the center commander, this method as he developed it proved to be the most efficient one for the center from the administrative standpoint; and from visits made by the senior consultant, infectious diseases, it was evident to him that the patients were most excellently cared for from a professional point of view. From practical application, therefore, the plan proved not only feasible but also highly successful, even though it was not possible to develop it in an ideal manner. In a few other centers similar organizations, though not quite so complete, were instituted.

In several other centers where the second plan was put into effect it proved not quite as satisfactory from a professional standpoint. As the plan was worked out practically it was as follows: Cases of pneumonia and influenza were sent to one hospital, mumps and measles to another, meningitis, typhoid fever, and dysentery to a third, and so on. The objections that arose to this plan in the hospitals where it was adopted were that the establishment of observation wards was not practicable and that occasionally cross infections occurred, probably from admitting to a ward suspicious cases of measles or scarlet fever. It also resulted in a rather uneven grade of professional care of the infectious diseases, for though some wards were most admirably cared for, others were not so well conducted. After a trial of this method in several centers, it was the consensus of opinion that the first method would be far preferable.

During the epidemic of influenza and pneumonia in the fall of 1918, considerable time was spent both at the front and in base hospitals in consultation with army and corps surgeons, and with commanding officers upon the proper hospitalization and care of these cases. Hospitals were established at Revigny and at Brizeaux in the First Army area for the exclusive care of these patients, while the many patients that could not be accommodated in these hospitals were adequately treated in other evacuation hospitals. When it was possible to hold all these cases in hospital and not evacuate them the disease ceased to overwhelm the forward hospital centers.

At this time a circular was prepared on the hospitalization and treatment of influenza and pneumonia which was published as Circular No. 51, chief surgeon's office, A. E. F.

During visits to hospitals the senior consultant gave advice regarding the handling of infectious diseases and the proper forms of cubicling and masking and when these methods were not in use they were insisted upon, or where they were improperly devised the methods were corrected. During these visits professional consultations were frequently held with chiefs of medical services upon many patients.

An attempt to furnish personnel for these infectious-disease hospitals and wards was impossible. Plans had previously been made to do so, and a group of clinicians had been trained in the United States for this purpose, but the exigencies of the situation rendered it impossible to obtain the services of these officers.

GAS POISONING ⁿ

The activities of the gas poisoning section of general medicine may be classified as follows: (a) Instruction; (b) hospitalization and treatment; (c) actual supervision of the care of the gassed.

INSTRUCTION

Instruction was carried out either by means of circulars of information or by lectures. Circular No. 34, chief surgeon's office, which had to do with the treatment of gassed patients, was prepared in this section. Other circulars in regard to the treatment of gas poisoning were prepared from time to time in this section. Either the consultant in general medicine in charge of gas poisoning, or other representatives of his office, gave lectures on the subject of the care and hospitalization of the gassed. These lectures were given to medical officers either in tactical divisions or at the Army sanitary school, Langres.

HOSPITALIZATION AND TREATMENT

The question of the hospitalization and treatment of gassed patients, especially in division and army areas, was given much study. An endeavor was made, by advice and conference with those in authority, to emphasize the important but simple principles involved, and to achieve their acceptance throughout the American Expeditionary Forces. After comparatively little study it became obvious that the question of the care of the gassed was largely an administrative one. From the clinical point of view the question was simple. The question of the hospitalization of the gassed was a more complicated one. Like the wounded soldier, the gassed soldier needed early examination and treatment and it soon became obvious that each tactical division in active warfare must have a mobile gas hospital as a part of its sanitary train. This need was met by utilizing one field hospital per division which was supplied with the necessary extra equipment to care for the gassed. Much correspondence and conference with those in authority finally led to a simple and standard equipment which could be used in divisional gas hospitals. The matter of the secondary hospitalization of gassed cases was complicated by the promulgation of the principle that gassed cases were not to be cared for in evacuation hospitals, although it was recognized that the gassed needed special care in a hospital at the level of the evacuation hospital, quite to the same extent as did the wounded.

The application of this principle led to the establishment of special hospitals for the gassed. During the actions which preceded the St. Mihiel and Meuse-Argonne operations there were no special hospitals for the care of the gassed. Gassed cases were passed through the evacuation hospitals rapidly and often

ⁿ The statements of fact appearing herein are based on "Report of activities of section of gas poisoning," made Dec. 17, 1918, by Lieut. Col. Richard Dexter, M. C., consultant in general medicine for gas poisoning. This report is on file in the Historical Division, Surgeon General's Office, Washington, D. C.—Ed.

received their first hospital treatment at the bases, a system which was unsatisfactory at best. In the St. Mihiel operation one gas hospital was established at the Justice hospital center, Toul, and one in the French gas hospital at Rambluzin. The personnel of these hospitals consisted of casuals or of officers and men loaned from base or evacuation hospitals, ambulance companies, etc. In each hospital one officer thoroughly conversant with the principles of the care of the gassed was stationed. The consultant in general medicine for gas poisoning had general supervision of the clinical work in both hospitals.

During the Meuse-Argonne operation, five hospitals were designated by the chief surgeon, First Army, to receive gassed cases. These were: Rambluzin, capacity, 250 beds; La Morlette, capacity, 550 beds; Julvecourt, capacity, 400 beds; Rarecourt, capacity, 250 beds; Villers Daucourt, capacity, 200 beds. These hospitals were enlarged by the addition of tentage and became the most important gas hospitals in the area.

The officers and personnel of these hospitals, as was the case in the St. Mihiel operation, were largely casual officers and men from ambulance companies, evacuation hospitals, etc.

After the first rush was over the five gas hospitals mentioned above carried on the care and treatment of the gassed in an eminently satisfactory manner. It was unfortunate that, owing to a shortage of nurses, only two nurses were available for use in these gas hospitals during the period from September 26 to November 11.

These hospitals received upward of 20,000 patients from September 26, 1918, to November 11, 1918. The cases were about equally divided between those who had been actually exposed to gas and those who, though they entered the hospital with a diagnosis of "gassed," had in all probability never been exposed to toxic warfare gases. The large number of cases that could not be classified as "gassed" were due principally to exhaustion, neuroses, light respiratory infections, or other unimportant conditions. The great proportion of these men could have been returned to duty without having left the army area had the proper machinery for this existed. In order that these light cases be returned to duty, rest camps must exist. Only one of the three corps in the First Army established a rest camp where men presumably fit for duty could be returned from the gas hospital and be further observed and tested before returning to the replacement battalion and the line. One corps had a replacement battalion and no rest camp, while the third had neither replacement battalion nor rest camp. With this imperfect machinery it was natural that large numbers of men who could have been returned to duty perforce were evacuated to the base.

The effect of the treatment received in the Army gas hospitals during this period on the condition of the men sent to the bases was apparent. There were found in the base fewer serious eye conditions than ever before, burns of the skin were in better condition, and cases of lung involvement were received in better general condition. Each case of definite pulmonary irritation was considered as a possible pneumonia and was held at the gas hospital for observation and treatment until it was deemed safe for the case to be evacuated.

The lessons learned during this period lead to the following conclusions:

(a) At least 1,000 beds for gas cases should be provided for each corps during active mobile warfare such as that of September and October, 1918.

(b) To facilitate evacuation and to economize personnel, not more than one hospital to a corps area is considered advisable. Experience has shown that the principle of having gassed cases cared for in special isolated hospitals is not a wise one. These hospitals were usually far from a railhead and off the main traffic routes. This necessitated much extra ambulance carriage, and increased the length of time that patients were in the ambulances. As no provision for gas hospitals was found in the Tables of Organization, these scattered units had to be operated as annexes to evacuation hospitals. This arrangement complicated the administration of these hospitals, and required duplication of administrative personnel. Experience showed that the recommendation to the effect that gassed cases be cared for in evacuation hospitals with augmented equipment and personnel, made in the letter of May 7, 1918, from the senior consultant in general medicine to the chief consultant, medical services, was sound, and should be accepted as a guiding principle in the matter.

(c) The personnel of gas hospitals should be proportionately the same as that of an evacuation hospital. The staff of medical officers need not be large; no surgeons are necessary. A chief of medical service expert in the problems of the diagnosis and treatment of the gassed and in the sorting of those presumably fit for duty is essential. The rest of the officers may be young men of ordinary capacity. Nurses are absolutely necessary for the proper care of the gassed.

(d) In order that men may be returned to duty, rest camps, where the men may be observed for a time and tested by simple exercises to determine their fitness for duty, are necessary. Whether the rest camp shall be under the immediate management of the corps or of the army is open to discussion. It is noteworthy, however, that while divisions change rapidly and frequently from one corps to another, they do not as frequently or as rapidly leave an army area. For this reason it would appear that the army would be able to return the men to their proper organizations better than could the corps.

SUPERVISION

In July, 1918, after conference between the medical director of the Chemical Warfare Service, A. E. F., the chief consultant, medical services, A. E. F., and the consultant in general medicine for gas poisoning, it was recommended that each division have one officer whose special duty it would be to take charge of the organization of the treatment, care, and evacuation of the gassed within the divisional areas. The officer was to be known as the divisional medical gas officer. This recommendation was accepted and authorized by General Orders, No. 144, G. H. Q., A. E. F., August 29, 1918. Owing to the late date at which the divisional medical gas officers were authorized, many divisions never received the full benefit of the services of such an officer. In those divisions where an officer functioned as medical gas officer, the care of the gassed immeasurably improved.

PERSONNEL °

(July 28, 1917, to July 15, 1919)

Col. William L. Keller, M. C., director of professional services.

SURGICAL SERVICES

Brig. Gen. John M. T. Finney, M. C., chief consultant.

Col. George W. Crile, M. C., senior consultant in surgical research.

Col. Arthur C. Christie, M. C., senior consultant in Roentgenology.

Col. Harvey Cushing, M. C., senior consultant in neurological surgery.

Col. Joel E. Goldthwait, M. C., senior consultant in orthopedic surgery.

Col. James F. McKernon, M. C., senior consultant in ear, nose, and throat surgery.

Col. Charles H. Peck, M. C., senior consultant in general surgery.

Col. Hugh H. Young, M. C., senior consultant in venereal and skin diseases and genitourinary surgery.

Lieut. Col. Vilray P. Blair, M. C., senior consultant in maxillofacial surgery.

Lieut. Col. James T. Case, M. C., senior consultant in Roentgenology.

Lieut. Col. Allen Greenwood, M. C., senior consultant in ophthalmology.

MEDICAL SERVICES

Brig. Gen. William S. Thayer, M. C., chief consultant.

Col. Thomas R. Boggs, M. C., senior consultant in general medicine.

Col. Warfield T. Longcope, M. C., senior consultant in infectious diseases.

Col. Thomas W. Salmon, M. C., senior consultant in neuropsychiatry.

Lieut. Col. Richard Dexter, M. C., senior consultant in general medicine for poisoning by deleterious gases.

Lieut. Col. Alfred E. Cohn, M. C., senior consultant in cardiovascular diseases.

Lieut. Col. Gerald B. Webb, M. C., senior consultant in tuberculosis.

Maj. Franklin C. McLean, M. C., senior consultant in general medicine.

REFERENCES

- (1) Circular letter from the Surgeon General to commanding officers of hospitals, November 11, 1917. Subject: Specialists. Copy on file, Historical Division, S. G. O.
- (2) Cable No. 427-S from General Pershing to The Adjutant General, Washington, December 30, 1917. On file, A. G. O., World War Division, chief surgeon's files, 321.62.
- (3) Letter from the Surgeon General to the chief surgeon, A. E. F., March 9, 1918. Subject: Professional services. On file, A. G. O., World War Division, chief surgeon's files, 321.62.
- (4) Letter from the Surgeon General to the chief surgeon, A. E. F., March 16, 1918. Subject: Organization of general and base hospitals. On file, A. G. O., World War Division, chief surgeon's files, 321.62.
- (5) Letter from the adjutant general, A. E. F., to Maj. J. M. T. Finney, M. C., December 21, 1917. Subject: General instructions. Copy on file, A. G. O., World War Division, chief surgeon's files, 201 (Finney, J. M. T.).

° In this list have been included the names of those who at one time or another were assigned to the division during the period, July 28, 1917, to July 15, 1919.

There are two primary groups—the heads of the division or the section and the assistants. In each group names have been arranged alphabetically, by grades, irrespective of chronological sequence of service.—*Ed.*

- (6) Report of the activities of the professional services, A. E. F., between April, 1918, and December, 1918, made December 31, 1918, by Col. W. L. Keller, M. C., director of professional services. On file, Historical Division, S. G. O.
- (7) Bevans, M. L., Col., M. C.: The function of medical and surgical consulting staffs determined by the late war. *The Military Surgeon*, xlv, No. 5, Washington, 1920.
- (8) Circular No. 2, H. A. E. F., office of the chief surgeon, November 9, 1917.
- (9) Report on the activities of the chief surgeon's office, A. E. F., to May 1, 1919, made by the chief surgeon, A. E. F., to the Surgeon General. Copy on file, Historical Division, S. G. O.
- (10) Final report of Gen. John J. Pershing, September 1, 1919.
- (11) Based on reports of the activities of hospital centers, A. E. F. On file, Historical Division, S. G. O.
- (12) Report of the activities of G-4-B, G. H. Q., A. E. F., to December 31, 1918, by Col. S. H. Wadhams, M. C. Copy on file, Historical Division, S. G. O.
- (13) Letter from the chief surgeon, A. E. F., to Lieut. Col. W. L. Keller, M. C., April 18, 1918. Subject: Detail as director of professional division, A. E. F. Copy on file, A. G. O., World War Division, chief surgeon's files, 321.60.
- (14) Letter from the chief surgeon, A. E. F., to the director of professional services, A. E. F., August 7, 1918. Subject: Consultants in the different specialties for hospital centers. On file, A. G. O., World War Division, chief surgeon's files, 211.52.
- (15) Letter from the chief surgeon, A. E. F., to Capt. De Forest F. Willard, M. R. C., August 23, 1918. Subject: General instructions. Copy on file, A. G. O., World War Division, chief surgeon's files, 321.62.
- (16) Memorandum from the chief surgeon, A. E. F., to the director of professional services, A. E. F., August 13, 1918. Subject: Designation of hospital centers for specialists. Copy on file, A. G. O., World War Division, chief surgeon's files, 321.62.
- (17) Circular Letter No. 7-a, chief surgeon's office, A. E. F., August 27, 1918.
- (18) Letter from the chiefs of medical and surgical services, A. E. F., to the chief surgeon, A. E. F., September 2, 1918. Subject: Personnel of professional services. On file, A. G. O., World War Division, chief surgeon's files, 321.62.
- (19) Letter from the chief surgeon, A. E. F., to the director of professional services, A. E. F., September 2, 1918. Subject: Designation of professional consultants and heart specialists at hospital centers. On file, A. G. O., World War Division, chief surgeon's files, 321.62.
- (20) Letter from the chief surgeon, A. E. F., to all division surgeons, September 8, 1918. Subject: Psychiatrists, urologists, and ophthalmologists in tactical divisions. On file, A. G. O., World War Division, chief surgeon's files, 321.62.
- (21) Letter from the chief surgeon, First Army Corps, to the chief surgeon, A. E. F., November 4, 1918. Subject: Corps consultants. On file, A. G. O., World War Division, chief surgeon's files, 211.52.
- (22) First indorsement from the chief surgeon, First Army, to the chief surgeon, A. E. F., November 5, 1918. On file, A. G. O., World War Division, chief surgeon's files, 211.52.
- (23) Third indorsement from the chief consultant, surgical services, A. E. F., to the chief surgeon, A. E. F., November 30, 1918. On file, A. G. O., World War Division, chief surgeon's files, 211.52.
- (24) Memorandum from the chief surgeon, A. E. F., to the chief of staff, S. O. S., January 3, 1919. Copy on file, Historical Division, S. G. O.

CHAPTER XIX

THE FINANCE AND SUPPLY DIVISION

MEDICAL SUPPLIES

In view of the fact that, in conformity with existing Field Service Regulations, which prescribed that the chief surgeon of a field army concern himself only with the broad principles underlying Medical Department administration without maintaining an office of record, the chief surgeon, A. E. F., delegated to the surgeon, line of communications, the immediate charge of medical supplies of the American Expeditionary Forces, and of the further fact that, in the reorganization of the American Expeditionary Forces, in accordance with General Orders, No. 31, G. H. Q., A. E. F., February 16, 1918, the chief surgeon, A. E. F., came to occupy the dual office of chief surgeon, A. E. F. and Services of Supply, it is in the interests of clarity to relate in so far as supplies are concerned, first the office organization of the chief surgeon, A. E. F., then that of the surgeon, line of communications. Following this, consideration will be given to the border questions concerning medical supplies; however, in so doing no effort will be made to differentiate, as controlling influences, the two offices referred to.

Two experienced medical supply officers, having arrived in the American Expeditionary Forces on July 18, 1917, the senior of these was made the surgeon, line of communications;¹ the other, the officer in charge of the medical supply depot which had been established at Cosne.² The surgeon, line of communications, had brought with him from the United States a small but especially chosen detachment of Medical Department enlisted men, a part of which he kept with him for his own purposes, the remainder being assigned to the medical depot at Cosne.²

There now was necessity, in the office of the surgeon, line of communications, for not only divisions paralleling those of the office of the chief surgeon, A. E. F., but for additional ones as well. These were the divisions of supply and of transportation, and they were organized accordingly.²

It is necessary here to explain that, at the time in question, the officers of both the chief surgeon, A. E. F., and of the surgeon, line of communications, were not only in Paris but also they were in the same building there; consequently, though they were separate, in effect the separation was to a lesser extent than one would suppose. It was definitely understood, however, that the surgeon, line of communications, in his capacity as such, was directly responsible for all questions pertaining to supply, with the exception of purchases abroad, which will be referred to below. This brought under his control the medical supply depots, and by this his responsibility was made to include distribution as well as procurement.

Initially, the amounts and kinds of medical supplies were prescribed in certain tables which appeared in the Manual for the Medical Department. All

Medical Department units of the American Expeditionary Forces were field units, consequently, medical supplies were initially provided for them³ and in theory were taken by them to France. In this connection, however, two factors influencing the medical supply question of the American Expeditionary Forces must be taken into consideration. It was known from the first that, because of the wide separation of our field of operations from the United States, a more prolonged and a higher quality of hospital treatment of our sick and wounded in France would be necessitated, thus creating the necessity for more and a wider variety of medical supplies than had been contemplated. Furthermore, in view of the fact that there was a shortage in shipping facilities, there was every necessity for obtaining abroad as many articles for our purposes as would, by so doing, obviate the necessity for having them sent from the United States, thus releasing so much tonnage space for other and more urgent purposes.⁴

The supply situation of course pertained to all supply branches of the American Expeditionary Forces, and to obviate their entering the European markets as purchasers without regulation and coordination, thereby being thrown into competition not only with themselves but with buyers from the Allied armies and the civil population as well, General Pershing, in August, 1917, created a general purchasing board for the American Expeditionary Forces.⁴ Since each supply department of the American Expeditionary Forces was to be represented upon this board, the chief surgeon, A. E. F., appointed a medical officer, known as medical purchasing officer, to represent him on the general purchasing board.⁵ In view of the fact that the general purchasing board functioned under general headquarters, A. E. F., the medical purchasing officer consequently was answerable to the chief surgeon, A. E. F., in the performance of his duties, rather than to the surgeon, line of communications, in whom, it may be recalled, was placed the responsibility for procurement as well as the storage and distribution of medical supplies. As it eventuated, however, it was not unusual for the medical purchasing officer to adopt the less time-consuming method of having the surgeon, line of communications, approve his action in so far as purchases were concerned.² This practice, begun after the removal of the office of the chief surgeon, A. E. F., to Chaumont, and while the office of the surgeon, line of communications, was still in Paris, continued thereafter without objections being made to it.

In November, 1917, the chief surgeon, A. E. F., established in his office at Chaumont a division of supplies.⁶ It was not his purpose to duplicate the activities of the division of supplies in the office of the surgeon, line of communications, and for that reason the office force of the division of supplies at Chaumont never assumed similar proportions. However, since matters pertaining to medical supplies were constantly being presented to the chief surgeon, necessitating detailed study before being acted on, and other matters of equal importance were occupying the complete attention of all the existing divisions of his office, the necessity for a supply officer could no longer be disregarded.

There was now, that is, about December 1, 1917, a supply division in the chief surgeon's office, A. E. F., whose function was acting upon questions of equipment, supply and transportation, and the division of supply in the office of the surgeon, line of communications, whose function was similar, with the exception that it did not act upon matters of transportation.

In the division of supplies, chief surgeon's office, A. E. F., routine matters, such as approval of the many requisitions for medical supplies that were received from tactical units in the advance section, were looked after. In addition, however, early efforts were made to establish a policy of supply. This necessitated a number of studies, chief among which were those with reference to the general organization project and the priority shipment schedule.

It is not surprising that, with the existence of the two supply divisions, misunderstandings and seeming duplication of effort should arise. The following letter from the surgeon, line of communications, explains his conception of the existing situation:

HEADQUARTERS, LINE OF COMMUNICATIONS,
OFFICE OF THE CHIEF SURGEON,
France, February 14, 1918.

From: The chief surgeon, L. of C.

To: The chief surgeon, G. H. Q., A. E. F.

Subject: Centralization of supply control.

1. Upon several previous occasions I have transferred to you communications illustrating the difficulties and delays inherent in our present system of supply with more or less divided control. I feel it incumbent upon me now to make representation to you concerning the general situation, to submit my recommendations for your consideration, and to request your decision. I do this because I am firmly convinced that the efficient and smooth working of the supply system demands unified control of all issues, and will more and more require it as the demands increase.

2. While the individual instances are not important in themselves, an accumulation of them works confusion in the minds of the officers affected and thus lessens efficiency. A recent instance is this: I received and acted upon a request from the gas officer for purchase for his laboratory. I am informed by Major Card that other copies of the identical communication were referred to you and acted upon—your action differing slightly from mine.

Purchases.—I have upon a number of occasions made purchases in France or England for stock, although this is, under the provision of general orders, placed directly under you. This matter should certainly be centralized, as I have previously written you, and I am convinced that it should be placed in this office.

More and more the purchasing officer has referred direct to this office questions of purchase, although he is immediately under you. This has probably resulted from the proximity of the offices in Paris. But more and more, too, you have been sending communications to Major Card through my office, not only for my information but for action. This I believe to be a tacit recognition of the advantage of the purchasing office being part of mine.

Red Cross.—The present situation is confusing I am sure, not only for me but for the Red Cross as well. A typical instance is the correspondence on mobile laundries referred to me under date of February the 13th.

I am informed that requisitions approved by division surgeons are being sent directly to the Red Cross. Inasmuch as these divisions are also making requisition upon the supply depots under my jurisdiction, there is no way of preventing duplication. This duplication I have attempted to prevent on the line of communications by directing all requisitions to the Red Cross to be sent through my office. Upon receipt they are referred to the supply depot for issue if the stock is available. The Red Cross is not called upon unless our depots can not supply the material.

Divisions.—All requisitions for whatever material should, in my mind, be referred to the depot, and if the material can not be supplied at that point should be referred to my office for suitable action—purchase or reference to the Red Cross, as seems best.

3. While under these suggestions I seem to be taking over a good many of the functions heretofore exercised by you, it is only because I believe that I am thereby relieving you of the details.

4. The needs of the Army as a whole or of any division thereof would be indicated to me, and it would become my duty to supply those needs getting the material from whatever source was available.

F. A. WINTER,

Colonel, Medical Corps, United States Army.

[First indorsement]

G. H. Q., A. E. F., C. S. O., *France, February 20, 1918.*

To Col. F. A. WINTER, M. C., *Chief Surgeon's Office,*

U. S. P. O. No. 717, A. E. F., France.

1. It is assumed that the questions raised above will be automatically settled when the supply division, C. S. O., S. O. R., has been reorganized according to plans now contemplated and becomes operative thereunder.

By direction of the chief surgeon:

A. P. CLARK, *Major, Medical Corps.*

As is indicated in the indorsement to letter above quoted, at this time plans had been consummated for the removal of the office of the chief surgeon, A. E. F., to headquarters, Services of Supply, there to be combined with the office of the surgeon, line of communications. Subsequently to this combination, effected on March 21, 1918, there was but one division of supplies for the Medical Department;² however, in view of the interest of the Medical Department in getting its supplies shipped from the United States to France, the chief surgeon, A. E. F., upon the removal of his office to headquarters, Services of Supply, left a medical officer at Chaumont to represent him in the first section of the general staff, general headquarters, A. E. F., since all questions relating to ocean tonnage were handled in that section.⁷

PURCHASES IN EUROPE

As previously stated, the policy of buying everything possible in Europe that would effect a saving in ocean tonnage was established early in the American Expeditionary Forces. But in so far as medical supplies were concerned it soon proved that European markets were practically depleted and thus would be unreliable as a possible source of supply.⁸

Upon the organization of the general purchasing board, and the assignment thereto of a medical purchasing officer, a copy of the Medical Department supply table, as it appeared in the Manual for the Medical Department, was furnished the board, with the view of having the possible European sources of supply canvassed to secure whatever articles were available.² It soon proved that none of the desirable articles could be obtained in this manner without a replacement of raw material; consequently, though arrangements were made later, through the general purchasing board, to procure such raw material, much of the work of the medical purchasing officer during the fall of 1917 was confined principally to the making of small purchases in Paris to meet the pressing needs of the different professional services of the Medical Department, as well as those of medical officers, and to the procurement of necessities, in small amounts and from time to time, pending the arrival from the United States of similar articles or material.²

After arrangements had been made for the procurement of raw materials, large purchases of such articles as bed frames, mattresses, pillows, sheets, crockery, and tableware were made in England and in France.²

In addition to purchases made by the medical purchasing officer, purchases were made locally by certain officers of the Medical Department, authority therefor being given from time to time by the chief surgeon.² Thus on December 15, 1917, the surgeon, line of communications, authorized commanding officers of base hospitals to expend Medical Department funds for articles properly chargeable to the funds appropriated to that department.² Such expenditures were not to exceed \$100 per month. On January 28, 1918, division surgeons were empowered by general headquarters, A. E. F., to authorize medical officers under them to make expenditures, chargeable to Medical Department funds, in amounts not to exceed \$100.² On the 14th of the following month, section surgeons were empowered to authorize medical officers in their respective sections to expend not to exceed \$250. As hospital centers were established, each hospital center commander was given a like authority.²

This delegation of authority to expend funds was done with the view of giving local Medical Department administrative officers more freedom than had formerly obtained, in so far as the purchase of articles in small amounts was concerned. Much inconvenience had obtained because of the uncertainty of the mail service, requests for articles frequently being delayed long beyond the arising of the urgent need for them, thus forcing the local commander to make emergency purchases, which under Army Regulations necessitated a formal report in each instance.² The delegated authority to make local purchases, referred to above, obviated the necessity for such formal reports.

In making foreign purchase of technical material for the Medical Department, A. E. F., it proved necessary to delegate much of this to representatives of the services concerned, such as X ray and laboratory.²

STORAGE SPACE

All departments were early called upon to make estimates of the storage space that would be required for supplies needed for different numbers of men, and it is interesting to note the relation shown by these estimates to the actual figures later established.

In September, 1917, the surgeon, line of communications, estimated that for 2,000,000 men in France there would be needed 1,200,000 square feet, of which 865,000 was to be at the base ports. At the same time he estimated that for 300,000 there would be required a total of 335,000 square feet.² Shortly afterwards the following estimates were submitted:²

	Square feet
300,000 men, 30 days, at Gievres.....	175, 000
1,000,000 men, 30 days, at Gievres.....	600, 000
75,000 men, 15 days, at Is-sur-Tille.....	20, 000
Additional (uncovered).....	5, 000
1,000,000 men, 15 days, at Is-sur-Tille.....	100, 000
Additional (uncovered).....	10, 000

On November 17, 1917, a revised estimate was submitted in tables prepared by the chief engineer, line of communications, for 2,000,000 men in all France of a total of 2,880,000 square feet roofed, with an additional 220,000 unroofed, distributed as follows:²

Base ports, 1,440,000 square feet, roofed, 80,000 square feet, unroofed.
Intermediate section, 1,200,000 square feet, roofed, 80,000 square feet roofed.
Advance area, 240,000 square feet, roofed, 60,000 square feet, unroofed.

At the time of the signing of the armistice, with nearly 2,000,000 men in France, the Medical Department had the following storage space allotted: ²

Location	Designation	Date established	Maximum storage space (square feet)
Cosne-sur-Loire.....	Intermediate medical supply depot No. 3.	July 15, 1917	100,000
Gievres.....	Intermediate medical supply depot No. 2.	Oct. 10, 1917	391,436
Is-sur-Tille.....	Advance medical supply depot No. 1.	Nov. 18, 1917	95,862
Liverpool, England.....	Medical supply depot.....	Aug. 7, 1918	24,430
Cristo, Italy.....	do.....	July 29, 1918	2,700
Montierchaume.....	Field medical supply salvage depot.	Dec. 13, 1918	162,500
Treves, Germany.....	Advance medical supply depot No. 2.	Dec. 27, 1918	100,000
Montoir.....	Base storage station.....	May 1, 1918	186,000
Nantes.....	do.....	Oct. 1, 1918	32,000
St. Nazaire.....	Medical supply depot.....	July 1, 1918	10,000
St. Sulpice.....	Base storage station.....	July 6, 1918	275,000
Bordeaux.....	Medical supply depot.....	May 6, 1918	25,000
Brest.....	do.....	Dec. 21, 1918	2,700
Marseille.....	Base storage station.....	July 8, 1918	76,000
Le Mans.....	Medical supply depot.....	July 20, 1918	10,000

WAREHOUSING

The fact that storage space was necessarily always assigned just as pressing need therefor arose prevented the warehousing of supplies in the manner best adapted to issues, and necessitated the constant shifting of supplies from warehouse to warehouse as supplies were received and space allotted.²

CENTRAL STORAGE FOR SORTING

As stated above, basic medical supplies were to accompany units going overseas. Such a shipment of supplies was sent at the time the earliest expeditionary forces went to France.⁹ Anticipating the arrival of these medical supplies in France and appreciating the necessity for securing in advance suitable storage space for them, the chief surgeon laid his plans accordingly. At the time it was understood that, roughly, our lines of communications would extend from the west coast of France (Bordeaux—St. Nazaire—Brest) through Tours, Nevers, Dijon, and Neufchateau to the front.⁴ Using these lines as a guide for the subsequent distribution of our medical supply units, and the further fact that the Gondrecourt area had been selected for billeting and training the 1st Division,¹⁰ Nevers was selected as a choice situation for the establishment of our first medical supply depot. Assurances were given the Medical Department that Nevers would be assigned to it; however, it proved later that Nevers was more suitable to other purposes than those of the Medical Department, in consequence of which another site for the interior location of a medical supply depot had to be selected. This secondarily selected site was Cosne,¹¹ and the recital of this in itself would have little if any present pertinence were it not for the fact that, whereas Nevers was on the main line from the base ports to the front, Cosne was on a secondary railway, and about 20 kilometers northwest of Nevers.

It is proper here to explain that the selection of a site for a medical supply depot so far inland as Cosne was based upon the fact that, because of the submarine warfare, it never could be foretold to which of the base ports convoys

of supplies in bulk from the United States would come. With such supplies as medical supplies, there are many items of which the amount used or the supply on hand is so small that original packages must first be sent to a central depot and there be distributed in smaller bulk to other depots. So, as soon as medical supplies were received at one or another of the several base ports they were shipped in bulk to the medical supply depot where they were sorted, placed in stock, and accounted for. From here they could be distributed as the occasions arose, and though some shipments necessarily had to be made back over the lines toward the base ports for Medical Department activities, the seeming disadvantages of such a method were far outweighed by the advantages of the arrangement adopted.²

As stated above, Cosne was the site for the first medical supply depot. When taken over by the Medical Department, A. E. F., the site consisted of an incomplete aerial bomb depot, being used at the time by the French.² The relatively few, floorless, and otherwise incomplete buildings available comprised about 50,000 square feet of floor space. Despite the absence of unloading facilities, a lighting system and other requirements of an activity of this size, this place was developed into our first fixed medical supply depot, a full-stock distribution point, and from this the entire Medical Department distribution system was largely elaborated. For a considerable period of time practically all medical supplies were concentrated at and likewise distributed from Cosne, intermediate medical supply depot No. 3.

The original plan was to develop the medical supply depot at Cosne. However, since, as stated above, Cosne was on a secondary railroad and the French avowedly were unable to handle increased shipments therefrom, the original plans for its expansion were abandoned and a substitute was adopted.¹²

Before further reference is made to the establishment of other medical supply depots, it is essential to state here upon what the supply system of the American Expeditionary Forces as a whole was based.

On August 20, 1917, when there were about 25,000 of our troops in France, General Pershing announced his policy of supply to the chiefs of the various services, American Expeditionary Forces.¹³ In his memorandum of announcement, with its subsequent additions, there was outlined a definite method of supply procurement, both from the United States by shipment overseas and by purchase in foreign markets. In this it was furthermore specifically set forth by what policy, under procurement, the increment of reserve supplies was to be accumulated. The supplies were divided into the following three classes: Automatic supply for articles regularly consumed so as to permit of an automatic supply; replenishment supply for articles of which specified stocks had to be maintained; and exceptional supply for articles of which no specific stocks had to be established. Furthermore, on September 7, 1917, General Pershing, in a cablegram to The Adjutant General, announced his decision to establish in France reserves of all classes of supplies for 90 days.¹⁴ This reserve was based on authorized issues, where such issues were regular, and on active periodic consumption of other articles based on British and French experiences during the war. General Pershing directed the chiefs of the various services, A. E. F., to prepare estimates, for cabling, first, a list of

four months' supplies to accompany each movement of troops from the United States. This provided not only a 90 days' reserve, but, in addition, one month's automatic supply for consumption and emergency. Second, a list showing the amounts which would have to be shipped monthly for each 25,000 men of the American Expeditionary Forces. In terms of days, the 90-day reserve plan provided for 15 days of the reserve to be in the advance section, 30 days in the intermediate section, and 45 days in the base ports.

Now, in accordance with this plan to have 90 days' reserve medical supplies in France, supply depots were established as follows: Base medical depots at each of the ports utilized by American troops; an intermediate depot at Cosne (intermediate medical supply depot No. 3, referred to above); an advance depot at Is-sur-Tille.¹²

To revert to the Cosne depot: The substitution depot, intermediate medical depot No. 2, was at Gievres, approximately midway between Tours and Nevers (the site originally selected for an intermediate depot) on the main line from the base port St. Nazaire to our front. This depot, established October 20, 1917, was to replace the depot at Cosne as the main issuing depot, the Cosne depot being retained as an auxiliary.² As the situation developed the depot at Gievres was increased in capacity and utilized largely for shipments of carload lots.²

DISTRIBUTION DEPOTS

With the view of having a distributing depot in the advance section advance medical supply depot No. 1 on November 18, 1917, was put into operation at Is-sur-Tille, a place subsequently used as our principal regulating station.¹⁵ This depot, an extremely important unit, largely took over the distribution of medical supplies to troops and units in the advance section. It was not, however, until considerably later that this depot was made a full stock unit. Prior to its being made a full stock depot, its activities were confined largely to the supply of medical units on duty with combat organizations.

Lack of storage space through France added many difficulties to the medical supply question, but those difficulties were particularly increased by the lack of storage space at base ports and by the insufficient docking facilities at the ports assigned.² It was appreciated early that a large amount of storage space would be required at base ports, and efforts were made to secure such space. No department could meet this need, however, until construction by the American Expeditionary Forces was accomplished, consequently it was many months before confusion at the docks was eliminated. During this period the Medical Department, as was the case with other departments, sent to the docks representatives whose duty it was to search for and sort out the supplies, and to make shipment of them to the proper depot in the interior.² Even later when this work was taken over by the Army Transport Service the representatives referred to remained at base ports to assist the Army Transport Service.² Shipments were received in every available port, many of which, for example, La Pallice, La Rochelle, Rochefort, Les Sables d'Olonne, had no storage space, though usually some temporary shelter was provided. Representatives of the Medical Department supply

division were assigned to duty in each of these ports.² Supplies were from time to time received in the ports of Cherbourg and Le Havre.²

In the vicinity of St. Nazaire, a large storage depot was established at Montoir.² Close to Bordeaux, a depot at St. Sulpice was established.² A depot was established at Miramas, adjacent to Marseille.² In each of these depots, the Medical Department was allotted space.² No depot was established at Brest and later when the shipments through that port were considerable, this lack of local storage space necessitated keeping stores without protection against the elements until sufficient railway cars could be provided.² No depot was established at Le Havre, through which port many of the supplies purchased in England were received.²

The car shortage in France was such that never was it possible to ship promptly from the ports material received from ships.² Though it was desired by the commanding general, Services of Supply, to establish a system of priority shipment from the base ports, this was not possible until after the establishment of the depots mentioned above. The following letter shows the situation in so far as it concerned the Medical Department:

HEADQUARTERS, LINE OF COMMUNICATIONS,
OFFICE OF THE CHIEF SURGEON,
France, January 24, 1918.

Memorandum to the commanding general, line of communications:

1. Referring to your memorandum of January 23, subject "priority of shipments from base sections," the following remarks seem pertinent concerning medical supplies.

2. In my opinion the principle is good. Under present conditions at the base, however, I can not see how any classification of medical supplies other than in one group as "medical supplies" can be made, owing to the multiplicity of articles upon the Medical Supply Table and to their varying importance—from articles of absolute necessity for the preservation of life to articles that might be well dispensed with in time of great pressure. This brings up the great importance of having at the base a classification warehouse, referred to in my memorandum of January 19.

3. Under present conditions, should our depots at the front or in the intermediate section need articles of vital necessity, such as gauze, ether, morphine, request upon you for order of priority for such articles would involve an order of priority for all, of all medical supplies, many of which might not be needed, and the importance of many of which would be less than articles supplied by other departments, thus working a hardship upon those other departments.

F. A. WINTER,
Colonel, Medical Corps, United States Army.

[First indorsement]

C. G., L. of C., A. E. F., *France, January 24, 1918*

To the C. in C., A. S., G. S.

1. Forwarded. I am strongly of the opinion that the Medical Department requires storage space at base sections 1, 2, and 5, in order that some classification of medical supplies may be made in those areas prior to shipments to the intermediate and advance depots. It is also appropriate in maintaining the 45 days' stocks in base areas.

2. The facts set forth in the memorandum from the C. S., L. of C., are decidedly pertinent, and it is easily comprehensible that shipments of important medical supplies to fill existing emergencies would be delayed, unless it were possible to make a separation of these supplies from those of unimportant variety. I believe the matter of storage space for classification at these ports for the Medical Department is a very important consideration.

F. J. KERNAN,
Major General, National Army.

Because shipping medical supplies from France to England, for the use of our Medical Department units there, proved difficult, arrangements were made to have such supplies shipped directly from the United States.² This necessitated the establishment in England of a medical supply depot, one being opened in Liverpool on August 7, 1918.² It functioned under the surgeon, base section No. 3, and was supplied in part through purchases made in Great Britain.²

"ARMY DUMPS" (MEDICAL)

The need was early felt for medical supply depots in advance of advance medical supply depot No. 1, Is-sur-Tille; the lack of them was considered not only uneconomical in the maintenance of supply but also a source of real danger to the supplies themselves.² So long as our tactical divisions operated independently, during which time they were moved from sector to sector, relieving troops of another nation whose equipment differed materially from our own, it was necessary for each division to have available at all times complete equipment, including many things not listed in the field equipment.² Division surgeons, in order to protect themselves against possible emergencies, overstocked their divisions; when movement of divisions was ordered, they necessarily left behind a good deal of material.²

In an effort to overcome this situation the surgeon, line of communications made the following proposal:

FEBRUARY 11, 1918.

From: The chief surgeon, line of communications.

To: The commanding general, line of communications.

Subject: Storage for Medical Department.

1. I request that the Medical Department be authorized to provide itself with one or more small storage warehouses with capacity of approximately 5,000 square feet each so situated that they can be reached by truck direct from the troops in the field. These storehouses are considered essential to the proper supply of divisions for the following reasons, and I believe that they should be provided at the earliest possible date. No elaborate system of issue is contemplated, simply a dump where the essential articles such as ether, gauze, dressings, morphine, first-aid packages, and standard Red Cross dressings can be stored and issued in emergencies: (a) Is-sur-Tille is too far from the line to be reached by truck, and rail transportation for less than carload lots is necessarily slow. I have from the start been convinced that for Medical Department storage, Is-sur-Tille is not suitable for the most advanced depot. (b) The problems of the Medical Department differ considerably from the other staff departments in that shipments to any one organization are neither so large nor a matter of daily occurrence. (c) Another important reason is the fire risk. Should the Is-sur-Tille depot be wiped out it would be most advantageous if there were small stocks in the front area sufficient to maintain supplies until such time as shipments from Cosne or Gievres could reach that area. (d) Economy: In my judgment if the troops in the field have absolute assurance that supplies can be had promptly when needed they will cut their requisitions to their immediate needs. They will thus not encumber themselves with unnecessary impedimenta.

2. If this recommendation meets with your approval, I request that the paper be referred to the commanding general, Advance Section, for selection of the towns and for leasing of the necessary buildings.

F. A. WINTER, *Colonel, Medical Corps.*

With the organization of the Paris group and, later, of the First Army, the establishment of army dumps became essential. In connection with the Medical Department purchasing business in Paris, there had been established previ-

ously in Paris a small medical receiving warehouse; and although this was utilized somewhat in the manner of an army dump, it was not essentially that type of depot. The first army dump established was at Lieusaint,¹⁶ and this was organized and administrated for the purpose of supplying combat units in the Paris group and, later, the First Army.

The supply table authorized for an army dump, which in common parlance later became known as the "Lieusaint list," grew out of the establishment of this army dump.¹⁶ The original basis of the "Lieusaint list" was the replacements necessary for one combat division for eight days, and the officer in charge of this distribution point was authorized to maintain in storage as many times this amount as there were combatant divisions in his area.¹⁶ This practically constituted a stock maximum for his depot. Practically this same system, although with a modified list, was adopted for use in planning the distribution of medical supplies when the offensive operations, directed toward the reduction of the St. Mihiel salient, and later against the Meuse-Argonne area, were in preparation. Gradually, however, a policy was developed of establishing army dumps for which there was authorized a definite fixed stock maximum without reference to the number of combat units to be supplied, but based more upon the number of such dumps established in relationship to the known number of divisions to be employed in the operation. Such dumps, for instance, were established at Toul, Souilly, Vaubecourt, Fleury, and Les Islettes, and in the order named.¹⁶

HOSPITAL CENTER DEPOTS

Upon the adoption of the plan of concentrating beds in hospital centers, there was need in each center of more than 5,000 beds for an issuing medical supply depot. The following letter on this subject was submitted to headquarters Services of Supply by the officer in charge of the supply division of the chief surgeon's office:

OFFICE OF THE CHIEF SURGEON,
AMERICAN EXPEDITIONARY FORCES,
HEADQUARTERS, SERVICES OF SUPPLY,
France, April 23, 1918.

Memorandum for the General Staff:

1. I am informed that the present scheme of construction for hospitalization includes for storage space for medical supplies the following: For each base hospital of 1,000 beds, one 20 by 160 foot building.

I understand that provision for a sorting warehouse for all supplies has been made. This warehouse to be 24 feet of a 50-foot wide building for each 1,000 beds.

2. I am of the opinion that in this matter the needs of the supply division have not been adequately provided for, and I request that the matter be given consideration, not alone from the standpoint of storage for a group of base hospitals, but as part and parcel of the entire scheme of storage and distribution of medical supplies in France.

The following data are pertinent: With a peace-time strength of 100,000 men and with an average morbidity rate of approximately 3 per cent, there were in the United States the following depots: New York supply, St. Louis supply, San Francisco supply, and field medical supply depot, Washington. I am unable to give the combined floor space of these depots.

3. It would therefore seem probable that the needs of a hospital center of 10,000 or 5,000 beds would be sufficiently great to warrant the establishment of not only storage space but of an issuing depot. It has been found by experience that beyond a certain point the amount of work done in an issue room may not be expanded without loss of space and energy and that it is desirable when that point is reached that another issue room be established.

When this becomes necessary no advantage is gained by establishing that second issue room in immediate proximity to the first, and in fact there are many advantages of its establishment elsewhere.

4. The advantages accruing to the service in this matter of an issue depot at the hospital centers are as follows: (1) Lessened fire risk. The disadvantage of having all supplies in a few depots is apparent. (2) Direct shipments. With a depot at the center direct shipment of bulky articles can be made from the ports, avoiding the difficulties and the use of rolling stock incident to transshipment at the main depots. (3) Economy. A full knowledge on the part of the hospital commanders that their emergency needs could be promptly met will unquestionably lead to small requisitions and particularly to an elimination of those articles infrequently used. (4) Embargo. With a depot in the immediate vicinity in times of railroad stress, shipments by the Medical Department can be entirely suspended so far as these centers are concerned.

5. It is apparent that, aside from the additional issue room, no greater amount of storage space is involved by these establishments than would be required for storage at the larger depots. If it is thought that this involves further construction and unnecessary storage space for the Medical Department, I recommend that this storage space be provided in lieu of an equal amount of space at Gievres. This space could be later provided at Gievres if conditions warrant it. I am confident that the Medical Department will require the space asked for.

6. I have estimated 10,000 square feet as the minimum that will be necessary for this depot, and I am inclosing an exhibit which is an approximate list of the supplies that will be carried in this depot, with their cubic feet contents. In addition to the actual space occupied by the materials, there would be necessary approximately 2,000 or 2,500 square feet as an issue room.

7. Of the 50-foot wide building, a 24-foot length of which is already authorized for each 1,000 beds, I am informed that the quartermaster desires 20 feet. This would leave for my purposes 200 square feet for each 1,000 beds, a total of 2,000 square feet, which is not sufficient for the Medical Department.

8. I therefore request that this storage building now authorized be increased in size to take care of the needs herein specified.

By direction of the chief surgeon.

F. A. WINTER,
Colonel, Medical Corps, United States Army.

APRIL 29, 1918.

Memorandum for the chief of utilities:

1. Forwarded. Request from chief surgeon for the increase in storage area at base hospitals.

2. Approval in general principle granted. Action to be taken in individual cases as supply of labor and materials is available.

By order of the C. G.

J. N. PARSONS.
H. C. SMITHER,
Assistant Chief of Staff, G-4.

Hospital center medical supply depots were established, and shortly before the armistice were at the following principal hospital centers:¹⁷ Allerey, Bazoilles, Beau Desert, Beaune, Clermont-Ferrand, Commercy, Kerhnon, Langres, Limoges, Mars-Sur-Allier, Mesves, Perigueux, Rimaucourt, Riviera, Savenay, Toul, Vichy, Vittel-Contrexeville.

MEDICAL SUPPLY PERSONNEL

More and more it became apparent that efficient service in the supply division of the chief surgeon's office was being hindered by the lack of trained personnel and particularly by the lack of sufficient personnel of any kind.² The

needs of the supply service, though appreciated, could not be met by the personnel division of the chief surgeon's office until such need became absolutely pressing.² Plans were submitted by the officer in charge of the supply division, chief surgeon's office, calling for personnel in the main supply depots for training purposes far in advance of the establishment of other depots, but these plans, although carried into effect in part, were never put into full execution and the result was that the establishment of large depots necessitated interference with the normal working force of the main depot.² This occurred repeatedly in intermediate medical supply depot No. 3, Cosne, from which depot a large part of the personnel for Is-sur-Tille, Gievres, Bordeaux, St. Nazaire, and hospital center depots and army parks were supplied.² From Is-sur-Tille also a considerable number of men were sent to army parks and other depots.² Certain units, known as medical supply units, and consisting of 3 officers and 45 enlisted men, well selected as a rule, arrived from the United States from time to time, but because of the medical supply situation in France, and because the method of administration and distribution was so entirely different from that which had been taught the members of the units in the United States, it was deemed inadvisable to send them out as units; furthermore, because the need was so pressing that personnel as it became available had to be allotted to a number of depots, at no time could the number of men comprising one of these units be spared for any one depot.²

MEDICAL SUPPLY INSPECTORS

It was planned also to have officers from the office of the chief surgeon act as medical supply inspectors. It was intended they should inquire into the adequacy of supplies; to instruct in the method of requisitioning; to meet incoming organizations and to advise them of the location of medical supply depots and the methods followed in the American Expeditionary Forces, the local situation, etc., to acquaint new units with the shortage of supplies and the necessity for economy; to supervise the establishment of storerooms at camp hospitals, wherein supplies could adequately be cared for and conserved; to direct the return to the proper depot of excess supplies; to receive criticisms; to make suggestions following investigations, as to the manner in which distribution of supplies could be better accomplished.² Such personnel it was never possible to obtain.² Officers of the Sanitary Corps, formerly noncommissioned officers, were thought to be best prepared for this work, but their services were in demand for other purposes and it was difficult to secure them in sufficient numbers even for the purposes of medical supply depots.²

CIVILIAN EMPLOYEES

Authority for the employment of civilians by the Medical Department, A. E. F., was issued from the supplies division, chief surgeon's office.² With the establishment of territorial sections in the American Expeditionary Forces this authority was delegated to section surgeons.² Many of the early hospital units took over old buildings, oftentimes cut up into many small rooms and therefore unsuited for hospital purposes. The personnel assigned to the units

was insufficient and due to the critical shortage of enlisted personnel, Medical Department, it was impossible to supply reinforcements. Camp hospitals were established in large number with a skeleton personnel from casualties, since these organizations were not provided for in the original Tables of Organization. A liberal policy in the employment of civilians was therefore established by the chief surgeon, A. E. F., and many were employed in lieu of Medical Department personnel not then available.² The maximum number of civilians employed was 4,273.

SPECIAL UNITS

A number of small Medical Department units were sent to the American Expeditionary Forces and there functioned partly under the control of the supply division of the chief surgeon's office.² Chief among them were the motor assembly units, instrument repair units, and optical units.

MOTOR ASSEMBLY PLANT

This plant consisted of a unit of officers and men for assembling and, later, repairing motor ambulances.² The services of such skilled men were so in demand that they were utilized at the base ports for assembling all motor transportation, and later on were turned over to the Motor Transport Corps.²

INSTRUMENT REPAIR SHOP

An instrument and typewriter repair unit of officers and men was also sent. Preparation for the reception of this unit had been made by the supply division of the chief surgeon's office and it was installed in a building in Paris.² Later, upon the publication of General Orders, No. 10, G. H. Q., A. E. F., January 6, 1918, which provided for the organization of the salvage service, the typewriter repair men were asked for by the chief quartermaster, and this portion of the unit was turned over to his department.²

OPTICAL SHOP

Personnel for eight branch shops were also sent to France completely equipped.² The main shop was established in Paris in connection with the instrument and repair shop; the eight branches were sent to various hospital centers.² Later, others were established.

The demands on the instrument and optical shops were so great that the original equipment and quarters proved inadequate. These were then moved to a larger building and an X-ray repair unit was organized in the original quarters.²

As no specific provision had been made for the repair of electrical instruments, the X-ray repair shop undertook this work as far as it was possible to do so with the staff available.²

The work of the repair units was by no means confined to repairs, as it was found desirable to alter equipment to meet the needs of military service as well as to build much special apparatus urgently needed in hospital practice.²

During the entire period of their operation these shops were called upon to work to their full capacity.² They fully demonstrated the wisdom of their selection and the necessity for such auxiliary units for the successful operation of the functions of the medical service.

AUTOMATIC SUPPLY

On September 18, 1917, in compliance with General Pershing's instructions concerning automatic supply, previously referred to, the first list of medical and hospital supplies for automatic shipment from the United States was submitted to general headquarters, A. E. F.² It was appreciated at the time that there were many inadequacies connected with this list that would necessitate constant correction, for the requirements of the Medical Department, in so far as any one item was concerned, could not readily be anticipated. Furthermore, the multiplicity of articles, together with the varying needs for them, made it practically impossible to anticipate exact amounts required. At the time in question, no great amount of data was available from allied sources; such data as were available had not been given much study.²

On February 1, 1918, the chief surgeon, A. E. F., caused to be revised the automatic supply list that had been prepared in September.² This was in conformity with the Surgeon General's request. One of the first steps in this revision was a further simplification; this was followed by an effort to determine what articles, because shipped in small original packages, should be shipped overseas every three months rather than monthly, and to determine what articles should be controlled by requisition. As a result, on April 2, 1918, the chief surgeon, A. E. F., submitted a table of articles, subsequently referred to as the automatic supply table.²

Though the principle of automatic supply never was questioned by the Medical Department, A. E. F., so far as the demands of that department were concerned, the automatic supply was not reduced to a working basis, chiefly for the following reasons:² At the time the table was submitted the stock of medical supplies in the American Expeditionary Forces was critically low. Not only was no information available as to the amounts of each article that would be used, but it was vitally essential that a reserve in France be established; consequently, in many instances, amounts specified in the revised automatic supply table were recognizedly excessive. It was not intended to perpetuate this; on the contrary, it was the intention from the first, to modify the automatic supply list from month to month, once an adequate reserve had been established in France. That this was difficult of accomplishment may be shown by the fact that stores ordered from medical supply depots in the United States in one month in amounts based upon strength figures for the American Expeditionary Forces for that month, usually did not reach France for several months thereafter, and were not available for issue for fully an additional month because of the necessity for their shipment to an interior medical supply depot for sorting preparatory to distribution.² Furthermore, beginning with the spring of 1918, and by reason of military necessity, the troop movement to the American Expeditionary Forces was expanded in a totally unlooked for manner, in consequence of which, when supplies ordered in January and based on the size of the American Expeditionary Forces at that time, were received six months later, they were obviously entirely inadequate.²

STATISTICAL STUDIES

Principally with the view of acquiring data that would permit of an intelligent revision of the automatic supply table, a statistical section of the supplies division, chief surgeon's office, was instituted in the early summer of 1918.²

It was the function of this section to tabulate the amounts of supplies received; amounts available at each medical supply depot; the daily movements of railroad cars containing medical supplies; the movement of supplies (both by weight and bulk) into and throughout France; the rate of issue per unit of men under varying conditions.² With such work it was the intention to so gain a position as to insure estimating accurately the stores required for replacements under any and all conditions presenting. Such an end, unfortunately, never was reached.²

One of the difficulties connected with this work was the fact that there were available neither figures on the amount of supplies required by each unit of men for a given period, nor the relation of weight to bulk for the medical supplies that would be required for the American Expeditionary Forces.² As a matter of fact, during the entire history of the Medical Department, A. E. F., initial supply formed a large part of the requirements, this in itself making the bulk of overseas shipments assume larger proportions to the weight than would have been true later after the movement of troops stabilized. The disproportion of bulk to weight was more marked as regards Medical Department supplies than was true of other branches, a fact that required repeated explanations. What led to such queries was the situation with the British. Though efforts were made to compare their Medical Department with ours, in so far as the relationship of bulk and weight of supplies is concerned, this could not be done because our Medical Department was importing bulky, permanent equipment through the necessity of a prolonged hospitalization of our sick and injured in France.² The British, on the other hand, elaborately equipped their hospitals only in Great Britain to which their sick and wounded could be readily transported.²

Though, as stated above, the work of the statistical section did not, and could not, reach desired results by reason of its late establishment, nevertheless it proved of great value and formed the basis of the later estimates of Medical Department tonnage required.² Also, this section provided the data upon which subsequent revisions in the automatic supply table were made, and upon which shipments of medical supplies from the United States were increased, decreased, or suspended.²

MEDICAL SUPPLY ECHELONS AND SYSTEMS OF REPLENISHMENT

Essentially this scheme of distribution involved the use of several echelons. From front to rear they were as follows:¹⁶ Divisional medical supply unit; army park medical supply dump (for each corps); army medical supply depots (for each army); Services of Supply depots (advance and base).

Toward the end of hostilities the manner of distribution from the supply echelons at the base to those in the most forward areas had been worked out with exceeding care. The plan of distribution, as evolved, was an elaboration of the policies under which the units previously had been functioning, but it

was better balanced, and all echelons were much more clearly defined. This was also true as regards the important technique of filling the requests for supplies of forward units from the unit next in the rear.¹⁶

AT THE FRONT

The officer in charge of the divisional medical supply unit normally indicated the need of all organizations in his particular division upon a consolidated requisition, which, after passing through the office of the division surgeon and that of G-1, was forwarded for filling to an army park.¹⁶ Often the division medical supply officer was far removed from the division surgeon and the division staff generally, and as a result numerous requisitions had to be sent to the nearest army park in a most informal manner and without any visa or approval. This was recognized as a necessity, and such contingencies were provided for by authorizing the park personnel to honor such emergency calls. It was found in practice that such authorizations increased the confidence of those in the forward areas and that the end result was a better and closer cooperation of all concerned.¹⁶

The logical medical stock for army parks included only articles of combat equipment and supplies and trench stores, and divisional units would naturally requisition only such articles, but in the early developmental days of the corps echelon it was found necessary to carry limited replacements at these parks, for such units as mobile and evacuation hospitals. It was very soon learned, however, that this produced a useless dispersion of equipment which it was difficult to obtain, and quickly rendered immobile the army park medical supply dumps—units, which of necessity, must remain mobile. It therefore became the policy to confine articles on the fixed stock maximum of such parks to those of combat material and trench stores. Just as soon as this decision was made it necessitated the establishment of a new echelon, inasmuch as large hospitals in the advance zone would now be required to replenish their stock from a new advance supply unit.¹⁶

It was therefore contemplated immediately to establish (and sites were actually selected) full-stock army advance medical supply depots on a basis of one per army.¹⁶ This unit, although carrying a complete stock, carried its articles, in so far as quantity was concerned, upon a very limited time basis. The functions, then, of this larger unit would be primarily to fill the calls of the army parks and secondarily to fill requisitions from medical units in the advance zone. The latter was obviated as far as possible by distribution from the rear through "controlled stores" in other depots.¹⁶

SERVICES OF SUPPLY

CONTROLLED STORES

As medical supplies began to arrive in France in amounts larger than the immediate needs therefor, it became possible to begin the stocking of depots other than that maintained at Cosne.²

At first only articles of which there was a supply more than sufficient to meet the immediate needs were stocked in the base storage stations, all others being sent to the depots in the intermediate section to maintain the stock there.² Later as supplies began to come in larger amounts, more and more

articles and larger and larger amounts were retained in the base storage stations.² A typical instance is that of beds and bedding, in fact of all initial equipment except the highly technical equipment that needed especially trained labor for its care and selection. It was impossible to distribute such material if for no other reason than the lack of available technical personnel to provide for its care in all the depots.

Because of the harbor facilities at Brest, shipment of supplies from the United States to France, assumed large proportions in so far as that port was concerned, and, as previously mentioned, the fact that there were no facilities for storage made it necessary to ship out as cars could be provided. Practically all the supplies received at Brest had to be routed to Gievres which acted therefore as a reservoir for that port.² Is-sur-Tille needs were supplied from Miramas to the fullest extent possible.²

As fast as the medical supply depots were built and became available, they were stocked with such articles as were in France in sufficient quantity to warrant distribution.² While the desirability of having completely stocked depots was appreciated, as matter of fact, it never became quite possible to accomplish this.² Though there was an abundance of such material as gauze and bandages, never at any time was there a sufficient amount of surgical instruments to permit stocking more than a few depots with them. It was felt that the depot should be stocked in the following sequence: First, intermediate medical depot No. 3, Cosne, which was then the main distributing depot; advance medical depot No. 1, Is-sur-Tille, a distributing depot for the advance area; the supply depots in the various sections; finally the hospital center depots. Necessity of the decentralization of issues was early appreciated, but complete decentralization could never be effected because of the absence of sufficient stock of several important items, and it was not until shortly before the armistice began that the medical stock was sufficient to permit its distribution to these depots.²

At first it was the practice of local district surgeons to secure from the docks such articles as were needed in their areas, making report thereof to the surgeon, line of communications.² This practice was permitted in view of the shortages in medical supplies at the ports and in view of the long delay in shipping to and from the depots in the intermediate section; but in order that equal distribution might be made, that accounting could be effected with the view of gaining knowledge of stocks available in France and, finally, that unnecessary rail transportation might be prevented, on July 1, 1918, the policy of "controlled stores" was established.² Thereafter, all supplies entering a base port were immediately under control of the representative of the supply division, chief surgeon's office, A. E. F., and were shipped in accordance with his instructions, or placed in storage subject only to the order of the chief surgeon, A. E. F.² In each of the base sections a local supply depot was established whence issues could be made upon the approval of the section surgeon, but issues from the controlled stores were not under his jurisdiction.² Reports of all receipts and issues from controlled stores were made to the office of the chief surgeon. Here they were tabulated daily, thus permitting the condition of stock in France and in each depot to be known at all times.

REQUISITIONS

From organizations.—Requisitions were submitted to the chief surgeon, in one copy only;² upon approval, they were forwarded to the proper depot. This method was established with the view of eliminating so far as possible all paper work and of issuing so far as possible all supplies asked for.² However, the fact that there was no duplicate requisition on file barred any possible checking against previous requisitions from an organization; every requisition was therefore acted on solely upon its face. Later, with the object in view of further expediting action upon requisitions, these were ordered sent from organizations direct to the depot. The officer in charge of the depot was designated assistant to the chief surgeon and was given authority to modify requisitions, but instructed to make such modifications largely upon the basis of the stock on hand.² Though this delegated authority placed upon the officer in charge of the depot the burden of responsibility for modifying requisitions, not ordinarily his, it was necessary in view of the many shortages in the stock in the early days.²

From supply depots and hospital center depots.—Requests from hospital center depots and from supply depots were sent to the chief surgeon, A. E. F., in whose office extracts were made according to the availability of stock and to the railroad situation; shipments were made from the most available point.² This permitted shipments to be made in carload lots direct from the ports to the requisitioner, thus conserving labor and time in the loading and unloading of cars and also the saving of cars. Frequently shipments were made direct from the docks.

PROPERTY ACCOUNTABILITY

In so far as accountability at the depots for goods received from the United States is concerned, it was early demonstrated that either accountability must be abandoned or the needs of the American Expeditionary Forces must be neglected.² Frequently invoices of medical supplies would be received from each of the several depots in the United States, bearing the same numbers. Since packages were numbered serially at each such depot, a shipment of supplies from the United States, when received at a depot in the American Expeditionary Forces, would contain not only not all of the supplies invoiced on one invoice, but several packages bearing the same number, thus making it impossible to determine from which depot the supplies were shipped and to which invoice they should be credited. Many supplies were received in France marked for special units and no invoices were furnished. Frequently these found their way into the medical supply depot and because the storage space was so inadequate there they were placed in stock and issued.² Supplies marked "Replacement supplies—division" were received and likewise placed in stock. In a similar way supplies received from European sources arrived at the depots. Partial shipments were made on purchase orders. It was therefore determined that accountability at the depots would be for those supplies actually received.²

Maintaining any system of accountability at the front proving impractical, General Orders, No. 74, G. H. Q., A. E. F., December 13, 1917, provided for the cessation of all accountability there.

EXPENDITURES

The system of payment from medical and hospital funds by a central disbursing officer upon an approved voucher proved to be full of difficulties.² Payment for laundry work done for moving organizations, payment for civilian employees who demanded payment weekly, payment for purchases made in emergency in small amounts, sometimes by a moving command, all theoretically had to be vouchered on Form 330, M. D., approved, submitted to the disbursing officer and paid by check. In order to obviate this difficulty the chief surgeon authorized the payment of such accounts in cash from hospital funds, making upon Form 330 a certificate to that effect, following which reimbursement would be made.² Such a system was required in the absence of actual cash being made available to officers commanding Medical Department formations.

INFLUENCE OF TRANSPORTATION ON THE MEDICAL SUPPLY SITUATION

From the source of supply, whether this was in the United States or in Europe, to the ultimate consumer the distribution of supplies was influenced by the overburdened transportation system.² Necessarily, the railroads and the ports of embarkation in the United States were congested; equally congested were the ports in France, several of which were illy equipped with docking facilities and cranes. The car shortage in France was great, and embargoes, complete or partial, were of frequent occurrence.² Differences in the languages added to the difficulties there. For a considerable part of the time lack of storage facilities at the base ports rendered impossible any satisfactory sorting of supplies, and lack of trained personnel to recognize the property of the various departments all combined to delay receipt of supplies at their proper depots.² Every available means of transportation was used, and this resulted in the splitting of consignments.² Frequently shipments were made by motor trucks and by canal barge from Havre and from inland points. The use of these various means of transportation at first caused an uncertainty as to whether or not delivery of the supplies would ever be made. With the growth of the American Expeditionary Forces, however, a system of convoy was established whereby trains or cars were accompanied by members of the American Expeditionary Forces. This in a large measure corrected the fault.

The result of all the factors outlined above was that the availability for issue of stocks received was much delayed, and that many supplies, even though known to be "somewhere in France," could not be considered as forming part of the reserve.²

MEDICAL SUPPLY LIAISON WITH THE UNITED STATES

It was early appreciated by the supply division of the chief surgeon's office that it lacked information concerning supplies for the American Expeditionary Forces available to supply officers in the Surgeon General's Office.² In other words, the supply division, chief surgeon's office was groping "in the dark" along certain lines. To remedy this, it was felt that conferees should be interchanged or that written reports should be submitted, but such a plan could not be effective by reason of the lack of adequate personnel.² On the other hand,

in the light of after events, it is thoroughly appreciated that one egregious error committed in the supply division of the chief surgeon's office was that, though it was known there that the automatic supply table was excessive, this was not made known to the Surgeon General's Office, thus creating a confusion in an activity that should have worked smoothly. Proper liaison would have obviated this.²

AMERICAN RED CROSS MEDICAL SUPPLIES

Regulations obtaining at the time we entered the World War required that organized voluntary aid for our land forces would, through the American Red Cross, constitute a part of the Medical Department.¹⁸ In the American Expeditionary Forces, in conformity with the regulations referred to, the American Red Cross military hospitals which had been established became a part of the Medical Department. However, the American Red Cross was charged by the commander in chief, A. E. F., with many activities entirely unrelated to the Medical Department (for example, civilian relief), and the chief of the American Red Cross in France was, by General Orders, No. 8, H. A. E. F., July 5, 1917, placed on the administrative and technical staff of the commander in chief, A. E. F., independent of the Medical Department. In this independent work, the Red Cross obviously required medical supplies, consequently large quantities were procured.

Since these supplies were freely made available to Medical Department units, the result, so far as these supplies were concerned, was duplication not only of effort but of supplies as well.² Our Medical Department personnel, being for the most part new and untrained in the methods of obtaining supplies, secured them from whatever source they found most available, and frequently, having no realization of the dangers of shortage of supplies in the world markets duplicated their requisitions and obtained supplies from both the American Red Cross and our medical supply department.² As an example, there was always a shortage of sheets during the period of hospital expansion.² The chief surgeon, A. E. F., established the policy of issuing six sheets per bed, and with this arrangement the Medical Department managed to keep just ahead of the demand.² Meanwhile the American Red Cross in France also had sheets and was being called upon to issue to units other than those for whose supply they had accepted responsibility, including some who had already received their allotment of six.² This duplication of supply resulted in a shortage in many of our hospitals at a time when these articles were needed. The result of this demand upon the American Red Cross was a financial burden to that organization which it should not have been called upon to bear and which, in fact, its officials had no desire to bear.²

In extenuation, however, it should be stated that, if the personnel of the Medical Department was largely untrained, so, too, much of the Red Cross personnel was equally or more so. But being exceedingly desirous of rendering service and frequently entirely unfamiliar with the normal method of supply, the officials in immediate charge of issuing Red Cross supplies felt that the burden of supplying hospitals was upon them. In some cases they were even unfamiliar with the existence of the Medical Department supply service; as a result, they not only made issues whenever called upon regardless of the fact that the articles

could have and should have been supplied from Army depots but they also failed to convey the information necessary to prevent a repetition of the demand upon them in the future.² In an effort to meet this situation, after consultation with the chief of the American Red Cross in France, and in full agreement with him, orders were issued by the chief surgeon, A. E. F., permitting issues from the Red Cross only after approval by division, corps, section of army surgeons, or by the chief surgeon, A. E. F.² As a matter of fact it was believed by the officer in charge of the supply division of the chief surgeon's office and by the American Red Cross officials in Paris that a further restriction would have been better; however, with the extensive unfamiliarity with our medical supply methods that obtained among requisitioning officers, it was felt unsafe to in any manner bar the way to the prompt securing of supplies.²

It is obvious that the purchase by the American Red Cross of articles also purchased by the Medical Department interfered to some extent with markets in Europe and in America. Articles that were available in the United States were shipped on both Medical Department tonnage and Red Cross tonnage and this duplication resulted in an overstocking of such articles in the American Expeditionary Forces.² This double procurement system did not in any way improve the situation in the American Expeditionary Forces in so far as the articles of which there were still a shortage were concerned, since that shortage resulted largely from the depletion of the markets at home and in Europe.²

Following conferences on the subject with the Red Cross officials, the chief surgeon, on February 11, 1918, initiated a cable to War Department asking that an agreement be reached in the United States with the American Red Cross headquarters, and that the great amount of made-up garments prepared by the women of America be collected by the Red Cross and turned over to the Army to meet their needs, thus permitting the demands upon the manufacturers to be reduced to a like extent.²

Red Cross contributions to the Army were considerable. Not only did this society establish entire hospitals in emergency, but also at all times its entire stock of supplies was made available to the Medical Department.² It supplied large quantities of front-line parcels made in France, which practically supplanted first-aid packets, and turned over in bulk to our depots and to the hospitals by direct shipment, in pursuance of a program given them by the chief surgeon, A. E. F., enormous quantities of made-up surgical dressings.² It undertook the production of standard splints and met the need thereof entirely until splints began to arrive from the United States.² It undertook the production of nitrous oxide and oxygen for the American Expeditionary Forces and established a plant in Paris for that purpose.² In all of these activities it turned over in large part the products to the Medical Department by which distribution was made.

FINANCE AND ACCOUNTING

PURPOSE

An act of Congress, dated September 24, 1917, authorized the Comptroller of the Treasury and the Auditor for the War Department to send to the American Expeditionary Forces portions of their organizations for performing there the functions of their offices. As a result of the establishment of the offices of

the Assistant Comptroller of the Treasury and of the Assistant Auditor for the War Department in France,¹⁹ and in accordance with the request of General Pershing, the chiefs of the various War Department bureaus organized units to function in the American Expeditionary Forces in a manner similar to the finance and property divisions of the several departments in the United States. Thus the unit formed in the Medical Department eventually became the finance and accounting division of the chief surgeon's office, A. E. F.²⁰

PERSONNEL

In availing himself of the authorization referred to above, the Surgeon General had an officer of the Medical Corps ordered to Washington for consultation, and upon arrival directed him to obtain and organize a force sufficient to care for the Medical Department accounts for an army of 2,000,000 men.⁹ After consultation with the Assistant Auditor for the War Department and with various other departmental authorities this officer modeled his organization on that of the corresponding division of the Surgeon General's Office.⁹ In order to get men qualified for this work all the large banks as far west as Chicago, and a large number of insurance companies, railroads, and department stores were requested to supply the names of drafted men qualified for service in this group.⁹ Prompt replies were obtained but, meanwhile, almost all the men named had been assigned to such duties that their transfer was not feasible. Banks were then asked to supply lists of their employees who were about to be called to the colors and from these by induction and enlistment the number desired was obtained. From time to time personnel to a total of 7 officers (including the chief of the division) and 135 men pertaining to this group were sent to France.⁹ It was purposed, in so far as the men were concerned, that many of them would perform clerical service not only in the office of the chief surgeon, A. E. F., but also at medical supply depots, with division surgeons, and in similar assignments.⁹

Because of numerous transfers, the enlisted personnel of this unit was further reduced to 37 men. One of the officers was sent to Paris for duty in the bureau of accounts, A. E. F., and one was assigned to duty with the general purchasing board, A. E. F.

On April 1, 1918, when the unit was attached to the office of the chief surgeon, it consisted of 6 officers and 47 men. Gradually other personnel were added until in February, 1919, this division consisted of 10 officers, 132 enlisted men, and 15 French civilians. This was its maximum strength.⁹

PREPARATORY WORK

In November, 1917, a temporary office was established at the New York medical supply depot where the plan of organization was developed, and recruits were examined to determine their technical qualifications.⁹ These men were then sent to Governors Island to be recruited and temporarily quartered. While there they were given some drill and were instructed in their prospective duties. Supplies also were collected at this place and plans made for the details of procedure and work of the detachment abroad.

The first section of the detachment, consisting of 5 officers and 100 men, left the United States on January 4, 1918, and arrived at St. Nazaire on January 17.⁹ From January 24 to February 13 the group was stationed at Bois, where its organization was perfected.²⁰ Plans of procedure were charted and suggestions worked out for the improvement of the methods of handling money and property accounts of the Medical Department.

After the unit moved to Tours, on February 13, it established its office, and about March 15 began its actual work in rooms assigned to it in barracks No. 66.⁹

A second section of this group, consisting of 2 officers and 35 men, which had arrived in France on February 9, was broken up, only the officers and 2 enlisted men eventually joining the original unit now at Tours.⁹

On May 1, 1918, the finance and accounting division became a part of the division of supplies of the chief surgeon's office, A. E. F.⁹

SCOPE OF ORGANIZATION

At first, the division had three chief activities: Money accounting, disbursing, and property accounting.¹² As occasion demanded, other functions were added until eventually the division had 15 distinct but related activities and was divided into corresponding sections.²⁰

DISBURSING

This section paid French commercial bills, all doubtful vouchers (when found to be legal) which were referred to it by other disbursing officers of the Medical Department, all laundry accounts, and all civilian personnel pay rolls.²⁰ For the month of January, 1919, these disbursements amounted to 844,207.70 francs, representing 573 vouchers. Prior to March 1, 1919, the disbursing officer paid one-third of the total number of Medical Department vouchers settled in France. Before payment the audit checked up duplications. A liaison was established with both the hospitalization division, chief surgeon's office, and the quartermaster department, A. E. F., in matters pertaining to laundry accounts whereby many hospitals through use of near-by quartermaster laundries saved many thousands of dollars. By April 30, 1919, this section had paid 4,593 vouchers. This section made considerable savings by eliminating duplicate payments and by arranging that hospitals use existing facilities instead of purchasing supplies and labor in open market. Records were made of the time elapsing between dates of purchase and dates of payment, and every effort was made to expedite settlements, thus promoting good will on the part of French vendors. Arrangements were made whereby quartermaster disbursing officers at base hospitals and hospital centers might pay accounts of civilians then employed, the Medical Department appropriations to be reimbursed by Treasury transfer. The importance of this provision is borne out by the fact that on November 30, 1918, there were 3,782 French civilians on Medical Department pay rolls. The average amount of purchases made direct by field organizations were made of record, by which many possible expenditures, by certain units which were given to extravagance, were eliminated.

AUDITING MONEY VOUCHERS

In this section were audited all accounts which already had been paid (except those on civilian pay rolls) by disbursing officers of the Medical Department, A. E. F.²⁰ So far as possible any errors in these accounts were corrected before they were forwarded to the Treasury Department at Washington for final audit. Vouchers were examined to determine whether they were legal, were correct charges against Medical Department funds, conformed to authorization for disbursement, were arithmetically correct, and there was no duplication. The analysis also included such matters as the time interval between delivery of supplies and payment therefor; the size of average purchase; comparison of volume and prices of similar articles purchased by different units. Data thus gained made possible not only an expedition of payments, but also an elimination of unnecessary purchases and an approximate standardization of prices. Because of this careful auditing very few suspensions were made by the Treasury Department in the accounts of Medical Department disbursing officers. By cancellation of erroneous vouchers and by securing the agreement of other departments, A. E. F., to pay items which properly belonged to their appropriations, many millions of dollars were saved to the Medical Department. A cash refund of approximately \$15,000 worth of overpayments was received, as a result of detection of overpayments and duplication of vouchers. The value of carefully auditing money vouchers and recording financial data was fully demonstrated when it was necessary finally to submit the accounts of medical disbursing officers to the Assistant Auditor for the War Department. These accounts were in such condition that they could be accepted without causing any difficulty to the disbursing officers.

ANALYSIS AND RECORD OF DISBURSEMENTS

This section made an index and abstracts of all vouchers before they passed out of the possession of the Medical Department.²⁰ These important abstracts included such data as the name of the vendor, material, price paid, date paid, by whom paid. They were made with the view of facilitating future settlement of claims which previous wars showed would continue to be made for many years.²⁰

ANALYSIS AND RECORD OF ACCOUNTS OF CIVILIAN PERSONNEL

This section audited and made abstracts from pay rolls of civilian personnel before the rolls were forwarded to the Treasury.²⁰ The abstracts showed names of civilian employees, authority for employment, when and where employed, when and by whom paid, etc. Prior to payment many erroneous items were eliminated, some refunds were procured, and some payments were transferred to other corps. Also in this section, efforts were made to provide for prompt payments.

ANALYSIS AND RECORD OF HOSPITAL FUNDS

This section audited the individual hospital fund statements rendered by the mess officers of the various Medical Department units, maintained a file of custodians of hospital funds, and records covering the amounts due to various hospitals from individual officers for subsistence while they were

patients in hospital.²⁰ At the peak of this work in March, 1919, 691 organizations were rendering monthly statements and the transactions represented by them amounted in one month to approximately 35,000,000 francs.²⁰ Not only were many underpayments and overpayments corrected, but efforts were made also to promote prompt payment of bills rendered by French civilians.¹² Deficits were prevented by issuing warnings to those concerned; in some instances, when gross negligence was evident, liquidation was secured from the private funds of officers who were responsible. Arrangements were made for the transfer of food stocks between organizations. The decision of the Comptroller of the Treasury giving the Medical Department the right to retain proceeds from sales of waste, and the right to turn in to the Quartermaster Corps unused food stocks led to relatively large savings; proceeds thus secured from the sale of garbage amounted to several hundred thousand francs.¹² One of the activities of this section pertained to the collection of funds from officers for payment of their subsistence while in hospital at the rate of \$1 per day.¹² Many officers inadvertently overlooked this obligation, but thousands of dollars were saved by carefully following them up.¹²

TRAVELING AUDITORS OF HOSPITAL FUNDS

This section consisted of a small staff which checked up records when there appeared to be anything irregular, but whose chief duty was instruction in the field of mess officers and hospital fund custodians in technicalities pertaining to these funds, the correction of errors, and the proper execution of disbursing and property papers.²⁰ Constantly in the field, they gave instruction to Medical Department clerks in the preparation of disbursement vouchers, property vouchers and returns;²⁰ also, they assisted very materially in closing money and property accounts of units returning to the United States.¹² Always, there were more calls for their services than could be met.²⁰

CUSTODIANSHIP OF CENTRAL HOSPITAL FUND

The work which engaged this section was taken over about September 13, 1918, when the hospital fund in the chief surgeon's office amounted to 18,800 francs.¹² Subsequently, this section controlled the central hospital fund, the loan or donation of small amounts to new organizations, the transfer of hospital funds between organizations, the reception of funds from disbanding units, and the closure of balances.²⁰ The fund on May 1, 1919, was over one hundred fifty times what it had been when taken over in the previous September, the item of interest alone amounting to almost as much as the initial central fund.²⁰ By May 9, 1919, it amounted to 2,862,792.31 francs;²¹ by May 24, it was 3,084,000 francs.²²

LIAISON WITH FINANCE DIVISIONS AND TREASURY OFFICIALS

By means of this section the finance and accounting division maintained close liaison with similar divisions in other departments, A. E. F., the finance officer, the finance requisition officer, and the officials of the Treasury in the American Expeditionary Forces.²⁰ This contact proved to be of value in keeping abreast of the various developments in financial matters in the American Expeditionary Forces.

ISSUE OF CLEARANCE CERTIFICATES

Through this section clearance certificates were issued covering money and property accountability.²⁰ In the cases of deceased officers these certificates were issued to the Treasury Department and in the case of others to the officers themselves. This work became considerable during the later history of the finance and accounting division; however, its performance was expedited through advance information concerning organizations or individuals returning to the United States which thus permitted the preparation of clearances even before these were called for. Arrangements were such that these certificates were issued at any hour of the day or night, usually a few minutes after they were requested. Of the total number of clearances issued prior to April 30, 1919 (other than those to deceased officers), only 156 were for parts of the accounts concerned, all other clearances being complete. Officers were assisted in every possible way in placing their accounts in correct form, and every effort was made to create good will among those returning to the United States and to civil life. Only 312 of the many certificates for deceased officers were for partial clearance and practically all of the debits in these cases were for small charges while in hospital.

BILLING ALLIES FOR HOSPITAL CHARGES

One section of the finance and accounting division was engaged in compiling data, from all available sources, relative to the hospitalization of allied troops in American hospitals, in converting these data into proper bills, and in submitting them to the governments concerned.²⁰ During the period that this work was being conducted by this section, these bills amounted to \$194,084.32. In April, 1919, this work was turned over to the Medical Department representative at Paris in compliance with orders that that officer be charged with the conduct of all financial transactions with foreign governments. Also, this section formulated some of the bills against other departments of the American Expeditionary Forces but this work also was turned over eventually to the Medical Department representative in Paris.

COMPILATION OF STATISTICAL DATA AND FINANCIAL REPORTS

This section compiled monthly, semiannual, and annual financial reports of various kinds, and also certain special reports which were of peculiar value at different times.²⁰ These financial reports, which were rendered to the offices concerned, covered almost every phase of the financial operations of the Medical Department. From statistical data which this division maintained it was possible to trace completely all Medical Department funds from the time they left the United States Treasury until they were expended for material and labor. These records covered the financial transactions of the Medical Department from the inception of the American Expeditionary Forces until April 30, 1919.

EXAMINATION AND FILING OF PROPERTY VOUCHERS

This section maintained from 7,500 to 10,000 individual files each of which concerned an accountable or responsible officer.²⁰ During its most strenuous period approximately 3,500 vouchers per week were handled. Invoices,

receipts, and returns were compared; discrepancies noted; certificates were audited, recorded, and filed; a card index for all officers responsible for medical supplies was maintained. The determination of property responsibility was the source of much trouble throughout the entire period of activity of the finance and accounting division, for it was seriously handicapped by the uncertain states of property accountability in that jurisdiction. This was occasioned by confusing orders capable of various interpretations. Before the armistice was signed accountability was especially uncertain, but an attempt was made to require a strict accountability, subject to due consideration of the conditions incident to active warfare. By May 1 returns to that date had been audited. Whenever necessary, statements of differences were drafted and the balance of the returns filed in such a way as to be accessible and to show the final disposition of the case and the authority for this action.

EXAMINATION OF PROPERTY RETURNS

More than 1,000 returns were received and audited by the section engaged in this duty.²⁰ It would have been completely overwhelmed had not Circular No. 68, chief surgeon's office, February 8, 1919, been issued, conformably to existing orders. This circular limited the officers responsible for Medical Department property to those at base hospitals, supply depots and schools and thus eliminated from such accountability thousands of other officers who would have been required to render returns.

LEGAL REFERENCE LIBRARY

The section in charge of the legal reference library maintained complete files and formulated indices of Army Regulations, general orders, bulletins, and circulars issued by the different headquarters, whether the United States Army or the American Expeditionary Forces, abstracts of statistics and decisions of the Comptroller of the Treasury, the Auditor for the War Department, the Judge Advocate General, etc.²⁰ This section had been organized merely for the use of the finance and accounting division, chief surgeon's office, in settling questions of legality and in keeping up to date different files of orders and decisions, but in addition, copies of its compilations were used by Treasury officials, the advisory board of war risk insurance, the secretary of the general staff, financial bureaus of other departments of the Army, and by various officers of the Medical Department either in the office of the chief surgeon or elsewhere.²¹ This section was also called upon to draw up contracts.¹² Questions were referred to it much as opinions were asked of attorneys in civil life, for the personnel of this section were lawyers in civil life.

LIAISON WITH BUREAU OF ACCOUNTS AND FINANCE BUREAU

With the formation in Paris of the bureau of accounts by General Orders, No. 5, Services of Supply, 1918, and the Finance Bureau, by General Orders, No. 199, G. H. Q., A. E. F., 1918, a member of the finance and accounting division, chief surgeon's office, was in liaison with each of them and was permitted to pass upon many contemplated plans which affected financial operations in which the Medical Department was concerned.²⁰ The cash expenditures

of that department until April 30, 1919, amounted to \$15,000,000. By May 8, 1919, the Medical Department had purchased in Europe medical and hospital supplies to a value of \$21,084,943.14, exclusive of the cost of 19 hospital trains (approximately \$5,166,666.67).²⁰

CENTRAL HOSPITAL FUND, THIRD ARMY

By March 21, 1919, instructions had been given for the establishment of a central hospital fund in the office of the surgeon, Third Army, and authority had been given that office to give or take from hospital funds of units in the Third Army such sums as might seem proper, to retain in the central fund such portions of hospital funds, of departing units as might seem desirable, to audit hospital fund statements of units in the Third Army and to retain audited statements, to arrange for payment of civilian personnel out of the hospital funds, Third Army, and to audit civilian pay rolls.²³

ARRANGEMENTS FOR RETURNING IMPORTANT FINANCIAL AND PROPERTY PAPERS TO UNITED STATES

Early in April, 1919, arrangements were made to send important financial and property papers to the United States by regular courier service, and at the same time a commissioned officer from the finance and accounting division, who was thoroughly acquainted with these various documents and could explain them to the interested departments in the United States.²⁴ A section was established in this division to collect all these Medical Department finance and property papers to be sent back to the United States and to compile a complete index of all communications and other papers which previously had been sent there.

DISCONTINUANCE OF FINANCE AND ACCOUNTING DIVISION

By May 14, 1919, the chief surgeon, A. E. F., approved the discontinuance of the finance division as of June 15 following.²⁰ Small detachments of the office force were to remain in service at Tours, Coblenz, Antwerp, and Washington, while other members of it were to be discharged. The entire division was then preparing copies of all records that might be needed after the originals had been returned to the United States. These copies were to be retained in the chief surgeon's office, A. E. F.²⁰

A small part of the finance and accounting division continued in the chief surgeon's office, to make such disbursements as were necessary and to maintain liaison with fiscal offices in the United States.²⁰ This service continued after the American Expeditionary Forces was succeeded by the American Forces in France and the American Forces in Germany.²⁵

During the period August to November, 1919, the closing months of our activities in France, claims for services rendered or supplies delivered to various hospitals and units throughout France were investigated and vouchers prepared and paid.²⁵ Many of the accounts so paid were of long standing, the original bills apparently having been lost.²⁵ Investigations of these charges were difficult, not only on account of insufficient receipts but also because officers who gave the orders, received the supplies, or engaged the services had returned to the United States.

After November 15, 1919, no further payments were made by the Medical Department, but all vouchers were prepared and submitted to the quartermaster disbursing officer for payment.²⁵ Since the medical disbursing officer ceased to function, a total number of 70 claims for services rendered or supplies delivered (many of these being final settlements covering a series of transactions with the various persons or companies and requiring a complete check of all bills rendered and paid in order to avoid duplication) were investigated and vouchers prepared for submission to the quartermaster for payment.

PERSONNEL

(July 28, 1917, to July 15, 1919)

SUPPLIES

Brig. Gen. Francis A. Winter, M. C., chief.

Col. A. P. Clark, M. C., chief.

Col. Norman L. McDiarmid, M. C., chief.

Col. C. C. Whitcomb, M. C., chief.

Col. Larry B. McAfee, M. C.

Col. Norman L. McDiarmid, M. C.

Col. J. R. Mount, M. C.

Lieut. Col. Harry G. Ford, M. C.

Maj. John M. Corson, San. Corps.

Maj. John S. Fielding, San. Corps.

Maj. Donald B. Inman, San. Corps.

Maj. Arthur W. Morehouse, San. Corps.

Maj. Arthur W. Proctor, San. Corps.

Maj. William G. Soekland, San. Corps.

Capt. Bertrand Emerson, jr., San. Corps.

Capt. Thomas W. England, San. Corps.

Capt. Morey Feder, San. Corps.

First Lieut. J. R. Shea, San. Corps.

First Lieut. John Shotwell, San. Corps.

FINANCE AND ACCOUNTING

Col. Henry D. Snyder, M. C., chief.

Lieut. Col. W. D. Whitcomb, San. Corps, chief.

Lieut. Col. W. D. Whitcomb, San. Corps.

Maj. Henry Aicklen, San. Corps.

Capt. E. O. Foster, San. Corps.

First Lieut. Eugene J. Berry, San. Corps.

First Lieut. Fred W. Eckert, San. Corps.

First Lieut. Russell W. Goodyear, San. Corps.

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- (2) Report on the activities of the supply division, chief surgeon's office, A. E. F., made to the chief surgeon, A. E. F., May, 1919, by Col. N. L. McDiarmid, M. C. On file, Historical Division, S. G. O.

- (3) First indorsement, War Department, Surgeon General's Office, July 25, 1917, to the chief surgeon, A. E. F. Subject: Forwarding medical supplies without requisition. On file, A. G. O., World War Division, chief surgeon's files, 400.314.
- (4) Final Report of Gen. John J. Pershing, September 1, 1919.
- (5) Memorandum for the chief of staff, H. A. E. F., from the chief surgeon, A. E. F., September 2, 1917. Subject: War diary. Copy on file, Historical Division, S. G. O.
- (6) Memorandum for the chief of staff, H. A. E. F., from the chief surgeon, A. E. F., November 25, 1917. Subject: War diary. Copy on file, Historical Division, S. G. O.
- (7) Report on activities, medical group, fourth section, general staff, G. H. Q., A. E. F., for the period embracing the beginning and end of American participation in hostilities, December 31, 1918, by Col. S. H. Wadhams, M. C. Copy on file, Historical Division, S. G. O.
- (8) Memorandum for the chief of staff, H. A. E. F., from the chief surgeon, A. E. F., October 7, 1917. Subject: War diary. Copy on file, Historical Division, S. G. O.
- (9) Historical report to the secretary, general staff, G. H. Q., A. E. F., on the Medical Department, A. E. F., to May 31, 1918, made by the chief surgeon, A. E. F. Copy on file, Historical Division, S. G. O.
- (10) Outlines of histories of divisions, U. S. Army, 1917-1919, prepared by the Historical Section, the Army War College. On file, Historical Section, the Army War College.
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- (14) Cable No. 145-S from General Pershing to The Adjutant General, September 7, 1917.
- (15) Report of medical activities, line of communications, A. E. F., during the war period, by Brig. Gen. F. A. Winter, M. D., undated. On file, Historical Division, S. G. O.
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- (17) Locations of Medical Department units, prepared in the office of the chief surgeon, A. E. F., as of October 17, 1918. Copy on file, Historical Division, S. G. O.
- (18) Manual for the Medical Department, U. S. Army, 1916, par. 536.
- (19) A handbook of economic agencies of the war of 1917. Monograph No. 3. Prepared in the Historical Branch, War Plans Division, General Staff, 1919.
- (20) Report on the activities of the chief surgeon's office, A. E. F., to May 1, 1919, made to the Surgeon General by the chief surgeon, A. E. F. On file, Historical Division, S. G. O.
- (21) Letter from the officer in charge, finance and accounting division, chief surgeon's office, A. E. F., to the chief surgeon, A. E. F., May 12, 1919. Subject: Report for week ending May 9, 1919. On file, Historical Division, S. G. O.
- (22) Letter from the chief surgeon, A. E. F., to the chief of staff, A. E. F., May 28, 1919. Subject: War diary for week ending May 24, 1919. Copy on file, Historical Division, S. G. O.
- (23) Letter from the officer in charge, finance and accounting division, chief surgeon's office, A. E. F., to the chief surgeon, A. E. F., March 24, 1919. Subject: Report for week ending March 21, 1919. On file, Historical Division, S. G. O.
- (24) Letter from the officer in charge, finance and accounting division, chief surgeon's office, A. E. F., to the chief surgeon, A. E. F., April 14, 1919. Subject: Report for week ending April 11, 1919. On file, Historical Division, S. G. O.
- (25) Letter from the chief surgeon, American Forces in France, to the commanding general, A. E. F., December 30, 1919. Subject: Report from July 1, to December 30, 1919. Copy on file, Historical Division, S. G. O.

CHAPTER XX

THE VETERINARY SERVICE

AS PART OF REMOUNT SERVICE

As related in Chapter V of Volume I of this history, when we entered the World War the Veterinary Corps of the Army, established the preceding year (1916),¹ was not completely organized. This accounts for the fact that, when General Pershing's headquarters sailed for France in May, 1917, it included no personnel for a veterinary service, nor did it carry plans pertaining thereto; none were existent. Veterinary officers were soon sent abroad in small numbers as requested, but the calls for them did not become urgent until shipments of animals in considerable numbers began in October of the same year.

In the absence of data concerning the organization of a veterinary service, and regulations for its guidance, it was necessary to develop these independently in the American Expeditionary Forces. The general organization project approved by headquarters, A. E. F., July 10, 1917, provided for 1 mobile veterinary hospital, staffed by 4 officers and 150 men for each corps, and for a unit of the same composition for each army. Since this project did not specify the veterinary service of divisions, the Surgeon General, on September 12, 1917, cabled General Pershing as follows:²

In your report on organization you recommend 1 mobile veterinary hospital, consisting of 4 officers and 150 men, for each corps and for each army. This personnel seems inadequate according to best advice obtainable here. Surgeon General recommends 1 mobile section of 1 officer and 20 men for each division and 1 base hospital, 5 officers, and 350 men for each 12,500 horses in forces based on probability of 10 per cent incapacitated. Does this meet with your approval?

In explanation of his plans General Pershing, on September 24, 1917, sent to War Department the following cable:³

Referring to your cablegram 169, report shows only one mobile veterinary hospital of corps and army; it does not include lines of communication veterinary hospitals which are in process of being organized. Am now organizing advance veterinary hospitals of lines of communication for 1,000 animals, which will be pushed up close into troop area; also base hospitals for 500 animals. Third Cavalry upon arrival will be used exclusively in remount service to which veterinary hospitals were attached. While immediate project not large enough for ultimate needs, it nevertheless is very flexible and will permit of any expansion necessary. Therefore, do not recommend any changes from present plans until we have more experience. Details of project for these hospitals will be found in study of service of the rear forwarded to The Adjutant General, by me September 21.

* * * * *

The project for the services of the rear of the American Expeditionary Forces alluded to above, based on the needs of 20 combatant and 10 replacement divisions, was approved by General Pershing September 18, 1917. That part of this project which applied to the remount and veterinary service was as follows:

Remount and veterinarian

Item number	Service	Unit	Total number of units	Total strength, officers and soldiers	Animals	Reference
Q-105	Corps	Remount depot	5	775	2,000	A. E. F. project, July 11, 1917.
Q-106	do	Mobile veterinary hospital.	5	770	2,500	Do.
Q-209	Army	Remount depot	1	504	2,000	Do.
Q-210	do	Mobile veterinary hospital.	1	154	500	Do.
Q-431	Line of communications.	Advance remount depot.		2,043	6,000	Do.
Q-432	do	Veterinary hospital.	26	7,592	26,000	
Q-433	do	Base remount depot.	2	2,044	6,000	
Q-434	do	Base veterinary hospital.	2	298	1,000	
Q-435	Total			11,977		
	Line of communications.	10 per cent replacement.		1,000		

NOTES.—Q-431. Two squadrons Cavalry increased so as to have 1 soldier per 3 animals; 28 officers, 2,000 men and 1 captain quartermaster, 6 veterinarians, 2 field clerks, 4 sergeant clerks, 2 sergeant storekeepers; total, 2,043.

Q-432. Seven veterinarians, 1 quartermaster sergeant, 10 sergeant farriers, 2 sergeant clerks, 2 sergeant checkers, 2 sergeant overseers, 3 sergeant horseshoers, 1 sergeant saddler, 1 corps saddler, 10 corps farriers, 3 cooks, 250 privates; total, 292.

Q-433. One squadron cavalry increased so as to have 1 soldier per 3 animals; 14 officers, 1,000 men, and 1 captain quartermaster, 3 veterinarians, 1 field clerk, 2 sergeant clerks, 1 sergeant storekeeper; total, 1,022.

Q-434. Four veterinarians, 1 sergeant quartermaster, 1 sergeant clerk, 1 sergeant checker, 1 sergeant overseer, 2 sergeant horseshoers, 5 sergeant farriers, 1 corporal clerk, 1 corporal saddler, 5 corporal farriers, 2 cooks, 125 privates; total, 149.

Q-435. Replacement to furnish all school details.

The project for the services of the rear could not constitute a comprehensive veterinary program, for a veterinary service was necessary wherever there were animals, whether at the front or at the rear. No provision was made in this project for veterinary officers in the higher administrative positions with corps and armies, or with the sections of the line of communications, and for this reason close contact between the troops and the service of evacuation and hospitalization was lost. The veterinary service, A. E. F., for almost a year was conducted conformably to General Orders, No. 39, G. H. Q., A. E. F., September 18, 1917. This order attached the veterinary service to the remount service, which in turn was a part of the Quartermaster Department, A. E. F., and thus provided that the veterinary service, despite the provisions of the national defense act, would function outside the Medical Department, for it charged the remount service not only with the reception, care, training, conditioning, and purchase of all public animals for the American Expeditionary Forces, but also with jurisdiction of both the mobile and stationary veterinary hospitals.

General Orders, No. 39, also provided that a 1,000-animal veterinary hospital with a staff of 7 officers and 293 enlisted men be attached to the advance remount depot in the proportion of 1 per army, and that it be capable of subdivision as required. The advance veterinary hospitals were ordered to care for disabled animals from the corps and army, and for all that might be abandoned by units. Intermediate veterinary hospitals were to be provided as

required, and base veterinary hospitals were attached to the base remount depots in base sections Nos. 1 and 2.

The tables of organization for the American Expeditionary Forces allowed 1 remount depot and 1 mobile veterinary hospital for each corps, and the same for army troops. They also provided for 1 advance and 1 base remount depot and 1 veterinary hospital and 1 base veterinary hospital for the line of communications, but gave no details for the organizations of these units.

No arrangement was made for the coordination of the veterinary service in the line of communications with that of the several divisions nor even for the coordination of this service in the different sections of the line of communications. Inevitably there ensued defective coordination in this service in these several jurisdictions, for in each of them the veterinary service developed quite independently.

General Orders, No. 42, G. H. Q., A. E. F., September 26, 1917, authorized 1 private, first class, or private, Medical Department, as assistant with each veterinary surgeon, and 1 sergeant, Medical Department, with each principal veterinary surgeon of each regiment of Cavalry and Field Artillery, in addition to the privates above authorized. This order also specified that when animals were treated in a regiment the commanding officer of the organization concerned would detail men from the troops, batteries, or Quartermaster Corps to care for them.

The Surgeon General believed it inadvisable under any circumstances to depart from the principle that the veterinary service should be controlled by the Medical Department, and to facilitate the adoption of this viewpoint, as well as to assist in organizing the veterinary service along lines similar to those planned for the Army in the United States, in November, 1917, he had two well-qualified veterinary officers sent to France for consultation in connection with organizing, equipping, and supplying the veterinary department of the expeditionary forces.⁴

These officers carried an advance copy of Special Regulations, No. 70, W. D., 1917, concerning the organization of the Veterinary Corps. They made a very comprehensive survey of conditions in the American Expeditionary Forces, and, in conformity with a request of the chief surgeon, A. E. F., one of them, on December 27, 1917, made the following explicit recommendations concerning the organization and operation of a veterinary service for the American Expeditionary Forces:⁵

1. Briefly stated, the objects of the Veterinary Corps should be to prevent disease among the animals of the Army; to relieve organizations, especially the mobile units, of sick and disabled animals, particularly those whose mobility is affected; to treat such of these animals as may be restored to a useful condition, and to attend to the destruction of those which are incurable or which can not be economically treated. With a sufficient and suitable personnel, properly organized and intelligently directed, these objects are easily within the range of attainment.

2. The necessary personnel is provided by General Orders, No. 130, Paragraph III (War Department, October 4, 1917), which directs the organization of a Veterinary Corps, National Army, for the period of the existing emergency, and authorizes 1 commissioned officer and 16 enlisted men for each 400 animals in the Army, the veterinarians of the Regular Army, of the National Guard drafted into the Federal service, and of the Officers' Reserve Corps in active service to be considered part of the total commissioned personnel authorized.

The personnel may be increased or decreased, as the needs of the service require, upon recommendation of the Surgeon General approved by the Secretary of War. The grades and the ratios of grades authorized for the commissioned personnel are 7 veterinarians with rank of major, to 20 veterinarians with rank of captain, to 36 assistant veterinarians with rank of first lieutenant, to 37 assistant veterinarians with rank of second lieutenant. The enlisted personnel is to consist of the following grades in the proportions indicated: Sergeants, first class, $2\frac{1}{2}$ per cent; sergeants, 5 per cent; corporals, 5 per cent; farriers, 20 per cent; horseshoers, 1 per cent; saddlers $\frac{1}{2}$ per cent; cooks, $1\frac{1}{2}$ per cent; privates, first class, $21\frac{1}{2}$ per cent; and privates, 43 per cent.

3. In accordance with section 5 of Paragraph III of this order, the Surgeon General has submitted tables of organization of the veterinary personnel, which have been approved by the Secretary of War. Regulations for the government of the personnel have also been submitted and approved by the same authority. The plan of organization upon which these tables and regulations were based is as follows:

(a) Veterinary officers, to be attached to divisional organizations, whose duty it shall be to closely observe the animals of their units for symptoms of communicable disease, to discover and report to the commanding officer, with appropriate recommendations, unsanitary or unhygienic conditions or practices which are likely to affect the health or efficiency of the animals, to treat sick or injured animals, and to arrange for the evacuation to a hospital of those which may interfere with the mobility of the organization or which may require a major surgical operation or prolonged treatment. With each veterinary officer there are 2 farriers, 1 private, first class, and 2 privates, a detail of this character constituting a veterinary field unit. One such unit is provided for each brigade of Infantry, 2 for each regiment of Field Artillery and 4 for the other organizations included in a division. Veterinary units are provided in the same ratio for detached divisional units. Two veterinary units are provided for each regiment of Cavalry.

(b) An organization which is called a mobile veterinary section is provided for each division for the purpose of receiving animals from the divisional organizations, giving them such treatment as they may require, and transferring them to a base hospital for treatment.

(c) A division veterinarian to coordinate and supervise the veterinary service of the division.

(d) A veterinary officer to act as meat and dairy inspector and render miscellaneous veterinary service.

(e) Base veterinary hospitals, 1 unit of 1,250 capacity to each 12,500 animals, located on line of communications, advance or intermediate section, to provide suitable quarters and veterinary service for animals which may be affected with communicable diseases or which may require a major surgical operation or prolonged treatment. All animals recovering in veterinary hospitals to be delivered to a remount depot under the direction of the remount service.

(f) Veterinary hospitals for remount depots which are not located convenient to a base veterinary hospital and also to care for diseases or injured animals debarked from transports.

(g) Veterinary units in remount depots, 1 unit to each 2,000 animals, to inspect the animals in the depot for symptoms of disease, to discover and report to the commanding officer unsanitary and unhygienic conditions, to treat minor injuries and ailments, and to arrange for the removal to a hospital of animals affected with a communicable disease and those requiring hospital care and treatment.

4. The personnel required for these various organizations is given in detail in Table No. 1, which is attached. In this table personnel is included also for (a) the corps mobile veterinary hospital, and (b) the army mobile veterinary hospital authorized by General Orders, No. 39, paragraph 2 (H. A. E. F., September 18, 1917).

(a) The corps mobile veterinary hospital ought to prove a valuable auxiliary to the division mobile veterinary sections, acting as a casualty clearing station and thus preventing the congestion of the mobile sections during an action.

(b) The army mobile veterinary hospital will perform a valuable service by receiving and providing treatment for animals whose mobility is not affected and which may require

only several days treatment, thus saving transportation to and from a base hospital and at the same time relieving the divisional units and the corps mobile hospital of the encumbrance of such animals. Animals recovering in the army mobile hospitals to be evacuated to the army remount hospital.

5. In order to organize, equip, and insure the proper functioning in the theater of operations of the several elements of the veterinary organization described, and to provide for their coordination and the cooperation with the other services of the Army, it is recommended that a veterinary officer be appointed chief veterinarian, with authority, under the immediate direction of the chief surgeon, to supervise and direct the veterinary service of the American Expeditionary Forces; also that three veterinary officers be appointed assistant chief veterinarians to assist in the administrative work, and that the necessary office assistants be provided. It is further recommended that for each army corps a veterinary officer be designated as corps veterinarian to supervise and administer the veterinary service of the corps.

6. The organization outlined is largely supplemental to that authorized for the American Expeditionary Forces by General Orders, No. 39 (H. A. E. F., September 18, 1917). It provides veterinary personnel for the mobile organizations as well as for veterinary hospitals and remount depots on the line of communications. It differs from the latter organization in that it places the veterinary hospitals and the other parts of the veterinary service under one administrative head and also in the veterinary personnel provided for the hospitals and remount depots, these latter changes being based upon the experience of veterinarians in remount depots and in the administration of veterinary hospitals. Nearly all of the questions and problems arising in the conduct of a veterinary hospital require a knowledge of veterinary matters for their decision. Moreover, the centralization of the administration of the veterinary service is recommended because every element of the veterinary organization has a definite function to perform and each must work in coordination with the other at all times to obtain satisfactory results. This harmonious cooperation can only be secured by placing the control of all parts of the organization under the control of one head. This plan also has the effect of centralizing responsibility. Cooperation between the veterinary service and the remount and other services can be arranged for between the administrative heads of these services and can be insured, if considered advisable, by regulations.

7. On the basis of the organization outlined above, the veterinary personnel required for the organization which have already joined the American Expeditionary Forces is 59 officers and 338 enlisted men. For 3 base veterinary hospital units of 1,250 capacity each, for 1 veterinary hospital for the remount depot at headquarters of base section No. 1, and for 3 veterinary units for the advance remount depot, all of which are at present most urgently needed, there will be required 25 officers and 1,184 enlisted men, making a total of 84 commissioned and 1,522 enlisted personnel for immediate requirements. The proportions of the various grades and the organizations to which they are allotted are shown in detail in Table No. 2, which is attached,

8. The divisional organizations which have not yet joined the divisions now here will require 11 commissioned and 85 enlisted personnel.

9. To provide the veterinary personnel for the other organizations included in the first phase of the priority shipment schedule, 59 officers and 1,005 enlisted men will be required.

10. For the organizations included in the second phase of the priority shipment schedule, 139 commissioned and 2,519 enlisted personnel.

11. For the organizations included in the third phase of the priority shipment schedule, 137 commissioned and 2,545 enlisted personnel.

12. The proportion of the several grades, together with the allotment to each organization, is given in detail in Table No. 2, which is attached.

13. On information obtained from tables of organization and from other sources which are regarded as authoritative, it is estimated that the organizations included in the first three phases of the priority shipment schedule will be provided with approximately 195,901 horses and mules. The veterinary personnel authorized for this number of animals by General Orders, No. 130, War Department, October 4, 1917, is 489 officers and 7,824 enlisted men. The total allotment of personnel on the basis of the organization described is 430 officers and

7,675 enlisted men. The proportions of the different grades authorized and allotted will be found in the summary at the end of Table No. 2. The number of veterinarians with the rank of major allotted is in excess of the proportion authorized because one major has been assigned to each base hospital, but the proportion allowed will not be exceeded because it is intended that some of these hospitals will be placed in charge of a captain of the veterinary corps. The slight excess of horseshoers and of privates, first class, allotted can be readily adjusted. The veterinary personnel for the organizations which have not yet left the United States can be organized there and trained in the cantonments.

At about this time the chief of the administrative section of the general staff, general headquarters, notified the chief surgeon, A. E. F., that the commander in chief had decided to suspend the application of so much of the Veterinary Corps regulations (Special Regulations, No. 70, War Department, 1917) as was in conflict with the organization of the remount service, A. E. F., as outlined in General Orders, No. 39, H. A. E. F., and that while the personnel of the Veterinary Corps would remain under the general supervision of the Medical Department, the commander in chief directed that the assignment of all veterinary personnel be made in accordance with recommendations submitted by the remount service.⁶ In consequence of these instructions, the chief of the remount service, A. E. F., assumed the direction of all of the veterinary personnel on duty in the American Expeditionary Forces.

On January 2, one of the veterinary officers referred to above, in an interview with the chief of the administrative section of the general staff, learned that the general staff was opposed to organizing a separate veterinary service.⁷ Such a service would therefore have to be attached to the remount service, an officer of the Veterinary Corps to be designated as chief veterinarian and detailed as assistant to the chief of the remount service to exercise technical supervision over the veterinary hospitals on the line of communications. It was pointed out that this would place the chief veterinarian and the veterinarians in the hospitals at a great disadvantage; the results of the hospitals' work would depend to a great degree upon how promptly sick and injured animals were transferred to them, and the chief veterinarian would have no control over this very important matter. Also it would be impossible for the chief veterinarian to introduce and maintain any custom of inspection to guard against the introduction of communicable disease or to provide for the discovery and correction of conditions or practices which would impair the health and efficiency of animals, although it was in this way that the Veterinary Corps could render the greatest service. Because of the absence of any system of inspection mange, glanders, and epizootic lymphangitis, three very infectious diseases, had already appeared among the animals of the American Expeditionary Forces. In view of these and other conditions, it was urged that a veterinary service should be organized as promptly as possible.⁷

At the instance of the chief of the administrative section, general staff, the following memorandum was prepared, January 4, 1918, describing a plan of organization which corresponded as nearly as was considered practicable with the requirements laid down by general headquarters, A. E. F.:⁷

1. In order that the veterinary service, A. E. F., may be coordinated with the general plans of organization and operation, as outlined by you, the following proposals are submitted for your consideration:

I. ORGANIZATION

ZONE OF THE ADVANCE

2. *Divisional veterinary personnel*.—One major, Veterinary Corps, National Army, as division veterinarian; 1 veterinary officer as meat inspector and for miscellaneous veterinary service; 4 enlisted men; 1 veterinary officer and 25 enlisted men, Veterinary Corps, National Army, for a mobile veterinary section. One veterinary unit consisting of 1 veterinary officer and 5 enlisted men, Veterinary Corps, National Army, with each brigade of Infantry; 2 veterinary units with each regiment of Artillery; and 4 to be detailed by the division veterinarian to the other divisional organizations as required. Total for a division, 15 commissioned and 89 enlisted personnel. Veterinary personnel to be detailed in same ratio to detached divisional organizations.

3. *Corps veterinary personnel*.—One major, Veterinary Corps, National Army, as corps veterinarian; 4 enlisted. Two veterinary officers, and 35 enlisted men, Veterinary Corps, National Army, for a corps mobile veterinary hospital, one for each corps; 5 veterinary units—2 with each regiment of Cavalry and 1 for the other corps troops. Total, 8 commissioned and 64 enlisted personnel.

4. *Army veterinary personnel*.—One major, Veterinary Corps, National Army, as Army veterinarian; 4 enlisted men. The veterinary officers, and 75 enlisted men, Veterinary Corps National Army, for an Army mobile veterinary hospital, one for each Army; 27 veterinary units—2 for each regiment of Artillery and 3 for the other organizations included in the Army troops. Four mobile veterinary sections, 1 veterinary officer and 26 enlisted men, Veterinary Corps, National Army, in each section. Total, 35 commissioned and 314 enlisted personnel.

LINE OF COMMUNICATIONS

5. *Evacuation hospitals*, to conduct animals from the corps mobile hospital, and from divisional mobile sections and Army mobile hospitals if necessary, to the railhead for transportation to base veterinary hospitals, two for each corps; 1 veterinary officer and 30 enlisted men, Veterinary Corps, National Army.

6. *Veterinary base hospital units* of 1,250 capacity, 1 to each 12,500 animals in the Army; 1 major or captain, Veterinary Corps, National Army, in charge, 5 additional veterinary officers and 349 enlisted men, Veterinary Corps, National Army.

7. *Veterinary personnel for remount depots*.—One veterinary unit for each 2,000 animals in the remount depot.

8. *Veterinary hospitals*, 500 capacity each, for remount depots and ports of embarkation base sections; 5 veterinary officers and 122 enlisted men, Veterinary Corps National Army.

9. *Veterinary sections of medical supply depots*.—One veterinary officer and 5 enlisted men for each section.

ADMINISTRATIVE OFFICERS

10. One veterinary officer, Veterinary Corps, National Army, as chief veterinarian; 3 veterinary officers, Veterinary Corps, National Army, as assistant chief veterinarians; and 11 enlisted Veterinary Corps, National Army; total, 4 commissioned and 11 enlisted.

II. OPERATION AND ADMINISTRATION

11. *Divisional*.—(a) The veterinary officers attached or detailed to divisional organizations are to exercise close supervision over the animals in order that the presence of communicable diseases may be promptly discovered, that cases of noninfectious diseases and of injury may be brought under treatment in their incipient stages, and that sanitary conditions and unhygienic practice may be corrected before they can do great harm. These veterinary officers should also provide immediate treatment for diseased and injured animals and arrange for the evacuation of those animals which require hospital care.

(b) The function of the mobile veterinary section is to receive the animals of the latter class, give them such attention as they may immediately require, and transfer them to the corps mobile veterinary hospital.

(c) The veterinary service of the division should be supervised and administered by the division veterinarian, whose relation to the veterinary personnel of the division should

be the same as that existing between the division surgeon and the medical personnel. The division veterinarian should also act in an advisory capacity to the division commander on all matters pertaining to the health and efficiency of the division. If, for military reasons, the office of the division veterinarian can not be at division headquarters, it can be located with the mobile veterinary section, unless otherwise directed by the division commander.

12. *Corps.*—The corps veterinarian should exercise the same function with regard to the veterinary personnel of the corps troops as the division veterinarian does with that of the division. In addition, he should direct the operation of the corps mobile veterinary hospital. He should arrange with the veterinary officer in charge of the army mobile veterinary hospital for the evacuation of animals to that organization and also notify the veterinary officer at headquarters of the advance section, line of communications, of animals to be transferred to the railhead in order that the latter may send forward from the evacuation hospitals the necessary conducting parties and arrange for the transportation of the animals to base veterinary hospitals.

13. *Army.*—The army veterinarian should supervise and administer the veterinary service of the army troops and direct the operation of the army mobile veterinary hospital. He should keep the veterinary officer at headquarters of the advance section, line of communications, advised of the state of this hospital in order that the latter may make any necessary arrangements for the evacuation of animals.

14. *Evacuation hospitals.*—These should be under the direction of the veterinary officer at headquarters of the advance section, line of communications. Their function should be to bring animals from the corps mobile hospitals, and directly from the divisional mobile veterinary sections and from the army mobile hospital, if necessary, and care for them until they are transferred to base veterinary hospitals.

15. *Base veterinary hospitals,* located in advance and intermediate sections, line of communications, are to receive and care for animals evacuated from the organizations in the zone of the advance and from remount depots and other organizations on the line of communications. Recovered animals to be transferred to remount depots.

16. The chief veterinarian should exercise technical supervision over the veterinary service, A. E. F. He should be given charge, under the chief surgeon, of the veterinary personnel, A. E. F., and should have authority to detail officers and enlisted men of the veterinary corps, National Army, for duty, and to coordinate the operation of the various elements of the veterinary organization. The office of the chief veterinarian should be located as the commander in chief may from time to time direct. One of the assistant chief veterinarians should be stationed at the headquarters of the advance section, line of communications, to supervise the evacuation of animals from the corps mobile veterinary hospitals, and directly from the divisional mobile veterinary sections and from the army mobile hospital when necessary, to base veterinary hospitals in the advance or intermediate section, line of communications. One of the other assistant chief veterinarians should be located at headquarters, line of communications, and should be authorized to supervise and direct the base veterinary hospitals located on the line of communications and also the veterinary service of the mobile organization operating on the line of communications. The other assistant chief veterinarian should be in the office of the chief veterinarian to render him such assistance as he may require and to act as an inspector of the veterinary service.

At the instance of the chief surgeon, A. E. F., a memorandum was prepared by one of the veterinarians from the Surgeon General's Office, giving the reason why the veterinary service should not be attached to the remount service, A. E. F., and a plan for its organization. This, on January 26, met with the approval of the chief of the remount service.⁷

On January 30, the chief surgeon invited the attention of the commander in chief to the unsatisfactory state of the veterinary service in the American Expeditionary Forces.⁷ His letter on the subject was accompanied by memoranda giving a thorough analysis of the needs of that service and included recommendations, in detail, concerning its organization, official relationships, and operation.

Meanwhile, the Surgeon General was endeavoring to exert his influence on the organization of a separate veterinary service, A. E. F., as is evidenced by the following extract from a letter written by him to the chief surgeon, A. E. F., under date of January 5, 1918:⁸

The Medical Department is charged by law with the responsibility for the administration of the veterinary service, and it is believed that this responsibility can not be evaded. The department, therefore, does not approve, for the present, the amalgamation of the veterinary service with any other branch of the military service. The department is endeavoring to obtain good material for the commissioned personnel of the Veterinary Corps, and is trying to place the whole service on a much higher plane than has been the case in the United States Army heretofore. Until the personnel has had greater experience in administrative matters it will need a great deal of assistance from medical officers of all grades and positions.

Furthermore, on January 21, 1918, the Surgeon General sent the following cablegram to General Pershing on the same subject:⁹

Veterinary service in United States reorganized and placed on independent, sound working basis suitable to requirements modern warfare. Principle followed similar to British service, excepting it is under direction of Surgeon General, which change now recommended by British. Suggest immediate steps be taken to similarly organize veterinary service with American Expeditionary Forces, creating chief veterinarian, and vesting in him direct control and responsibility to chief surgeon and commanding general. Lieutenant Colonel Aitken, British veterinary service, sent here your request, has been material assistance in affecting reorganization. Would you consider his assignment to your headquarters at early date, as veterinary adviser in coordinating veterinary service of interior and theater operations? New rules and regulations this service approved, printed, and circulated. Copies in sufficient number shipped France.

On February 6, 1918, the following cablegram was sent to War Department in reply partly to the above-quoted message and in explanation of the adherence to the plan of not having an independent veterinary service, A. E. F.:¹¹

Subparagraph A. Not advisable to depart from our plans as given in service of rear project, and put in effect by orders issued last September. Veterinary service here branch of remount service; administrative matters at various headquarters handled through remount divisions of chief quartermaster's offices in which veterinarians are detailed as necessary. As far as possible veterinary officers given complete charge of veterinary hospitals, but results so far are not satisfactory. Absolutely necessary here for the present at least to keep veterinary service largely under supervision officers of mounted services experienced in administrative work and not create another independent service with no experienced personnel. We have too many loose agencies already. At present it is clear that veterinary personnel will render most efficient service if not charged with extensive administrative responsibility. The Medical Corps will handle the supply of medicines and other materials through medical supply depots; will handle personnel questions pertaining to veterinary services and exercises supervision over professional phases of work. Veterinarians in the various headquarters offices will perform the inspection and supervise performance of the professional work.

Subparagraph B. It will be satisfactory if you ship corps mobile veterinary hospitals in accordance with paragraph 1 your cablegram 622. We will reorganize in accordance with our plans and necessities of service here. The extra officers and soldiers in addition to those called for in our service of the rear project will allow us to strengthen the veterinary personnel assigned to divisional trains of Infantry divisions so that they will be able to attend sick or wounded animals of Infantry regiments and other units not provided with veterinary personnel. No changes in tables of organization with regard to this considered desirable at present. Any changes found desirable will be recommended later. Do not approve of assignment 1 mobile section to each Infantry division for evacuating animals to rear, which under our system is to be effected by corps veterinary units.

Subparagraph C. Other veterinary units as given in your cablegram 622 satisfactory. All should be sent accordance priority schedule.

Subparagraph D. Number of officers for all remount units as given in paragraph A, your cablegram 673, except corps remount depots appears excessive. Provision otherwise satisfactory.

Subparagraph E. Reference headquarters personnel for remount and veterinary service following should govern. Necessary personnel will be part of chief quartermaster's offices and medical supply depots. Unnecessary and undesirable to have this personnel separately prescribed as present time. Sufficient personnel available here for all above assignments provided you send all remount and veterinary units organized as indicated in preceding paragraphs and supply replacement drafts in accordance with arrangements for automatic replacements. If any additional personnel is required from United States for remount and veterinary service you will be promptly advised.

No further efforts were made, for the time at least, to secure the detachment of the veterinary service from the remount service, A. E. F. However, because certain responsibilities of the Medical Department, in connection with the veterinary service, could not be overlooked, and since these had not been definitely covered in instructions promulgated by general headquarters, A. E. F., the chief surgeon, A. E. F., seeking a ruling in the matter, sent, on February 22, 1918, the following memorandum to the chief of staff, general headquarters.¹¹

1. From all that has been said and written and cabled during the last two months, I gather that, so far as the veterinary service is concerned, it is the duty of the Medical Department to furnish personnel and supplies for the veterinary service, A. E. F., and that the remainder of the veterinary service will be handled by the remount service. Will you please indicate if my conclusion on this subject is correct.

2. I consider it most important that a definite answer shall be given in this matter before the contemplated change is made. My only desire is that the Medical Department shall meet the obligations expected of it in the organization which has been adopted.

The pronouncement from general headquarters, A. E. F., concerning the above-quoted memorandum from the chief surgeon was to the effect that, since the veterinary service was a part of the remount service, the chief surgeon, after supplying needed personnel to the Medical Department, would report other personnel to headquarters, Services of Supply, for assignment to the remount service for veterinary purposes.¹² In so far as veterinary supplies were concerned, these were to be supplied by the Medical Department.¹²

The officers who had been sent to France at the instance of the Surgeon General in November, 1917, with a view of organizing a veterinary service, continued their efforts until March 10, 1918, when they submitted a final report.⁷

Believing that there was nothing further that they could do and that their mission was a complete failure, they returned to the United States, leaving in the hands of the assistant chief of staff, G-1, general headquarters, A. E. F., a lengthy memorandum and a copy of a general order pertaining to the organization and administration of the veterinary service, A. E. F., which they had proposed.⁷

On March 10, 1918, the chief quartermaster, A. E. F., was directed by the commander in chief to appoint a chief veterinarian, A. E. F., and accordingly a veterinary officer of the grade of major was assigned to that position.¹³ The newly appointed chief veterinarian's duties were those of a technical adviser to the chief of the remount service rather than those of an administrator. He was

not permitted to administer his department; he was subject to the control of the chief of the remount service, the latter in turn to that of the chief quartermaster. Consequently, in all matters affecting the advance area, the chief veterinarian had to communicate his instructions through, and subject to the approval of, not only the officers mentioned but also of the general staff, general headquarters.¹³ The delay in transmitting instructions through these channels was considerable, particularly where each successive head, being responsible for each proposal submitted through him, wanted details before he would approve and transmit any request. This situation was of most serious import when the outbreak of an epidemic was reported, for the chief veterinarian, being only a technical adviser for his own branch of the service, was not permitted even to exercise technical administrative duties over other veterinary officers.¹³ Eventually, however, he was given authority to correspond with division veterinarians direct on technical subjects.¹³

Neither the chief of the remount service nor chief veterinarian had any direct authority in the zone of the advance, so that the administration of the two services, remount and veterinary, in the armies had to be effected through general headquarters.¹³ As a result of this situation some 75,000 animals in the advance area were practically outside of their administrative control.¹³

Since animals on purchase were shipped direct to remount depots, and 70 per cent of the animals became sick on arrival, the remount depots became virtual veterinary hospitals;¹³ consequently animals cured at veterinary hospitals were issued direct to divisions. Veterinary units arriving in France from the United States had to be sent to remount depots instead of to veterinary hospitals because of the great numbers of sick animals there.¹³ Mange spread extensively among all the animals of the American Expeditionary Forces, and in the advance zone thousands of them had been treated by hand through lack of properly constructed mange hospitals with hot sulphur baths.¹³

A systematic method of remount and veterinary construction did not go into effect until June, 1918.¹³ All veterinary hospitals were crowded to the utmost, and half of our sick animals were being treated either at remount depots or with their organizations. At one time 600 animals of the 1st Division were turned over to a French Cavalry regiment for treatment for the cure of mange, as we had not sufficient hospital space to treat them.¹³ Glanders broke out frequently among the animals of combat divisions, and because it took five days or more through the necessary channels of administration to reach the outbreak, the disease naturally spread to a greater number of horses than would have been the case with a more direct system of control.¹³

On July 3, 1918, General Pershing requested the War Department to send to France the best available senior veterinarian for administrative duty.¹⁴ The officer selected sailed on July 30, 1918.

Reports received about this time showed an enormous amount of sickness and disability among public animals.¹⁵ For weeks the noneffective rate was above 30 per cent, and the prospects seemed excellent for a complete breakdown of the veterinary service and the practical immobilization of animal organizations.

The defects in service which had developed up to this time were attributed by the officer who had been acting as chief veterinarian, to the following conditions:¹³

(1) Lack of technical administration of the veterinary service by a chief veterinarian; (2) mixing of diseased and healthy horses at remount depots; (3) slowness of construction of both veterinary hospitals and remount depots; (4) the necessity of entire separation of a service of supply such as was the remount service, and a service of salvage, such as was the veterinary service; (5) the lack of a high ranking officer representing the veterinary service as a separate organization.

General Orders, No. 122, general headquarters, A. E. F., July 26, 1918, revoked General Orders, No. 39, 1917, but the veterinary service remained attached to the remount service and under its jurisdiction. The chief veterinarian retained technical supervision of the veterinary service, A. E. F., and the necessary officers and personnel for this purpose were assigned to his office.

In a memorandum to the commander in chief, A. E. F., dated August 9, 1918, the chief surgeon, A. E. F., remarked that the existing organization in veterinary service was as illogical as making the medical service of an army a function of the recruiting and replacement service.¹⁶ It prevented the development of the veterinary service along professional and scientific lines and resulted in the mingling, at all points along the line from rear to front, of serviceable horses going forward with sick horses going back, thus resulting in a very high mortality rate and a great deal of infectious disease. Seventy per cent of the animals in the American Expeditionary Forces at the time were suffering from sickness, whereas in the British service the proportion was only 7 per cent from all causes.¹⁶

At this time a veterinary officer and a remount officer of the British Army were assigned to headquarters, Services of Supply, in response to a cabled request for their services in order that they might give the American Expeditionary Forces the benefit of their experiences.¹³ These officers, through the headquarters of the British mission, made certain recommendations for betterment in the remount and veterinary services, A. E. F. The British veterinary officer, who had been of great assistance to the veterinary service in the United States, obtained audiences with the chief of staff, A. E. F., and the chief quartermaster, A. E. F., and recommended that the veterinary service, A. E. F., be made to conform to Special Regulations, No. 70, War Department, which order he had assisted in formulating.¹³ After the chief of staff, A. E. F., and chief of the remount service had inspected several remount depots and veterinary hospitals, this recommendation was approved and General Orders, No. 139, general headquarters, A. E. F., August 24, 1918, was issued, directing that the veterinary service be transferred from G-1 to G-4, general headquarters, that a veterinary division be established in the office of the chief surgeon, and that the veterinary service, A. E. F., conform to Special Regulations, No. 70, War Department, 1917. This order was the basis of the perfected organization of the veterinary service, A. E. F.

AS PART OF MEDICAL DEPARTMENT

Under the chief surgeon the officer at the head of the veterinary division of his office was now charged with the administration of the veterinary service, A. E. F., whose relations with the remount service were to be those prescribed

by paragraph 138 of Special Regulations, No. 70.¹⁷ The organization of veterinary units was to continue as prescribed by the tables of organization then in force.

On August 27, a Veterinary Corps officer was made chief veterinarian, A. E. F., and was assigned to the chief surgeon's office, and, on August 29, a veterinary division of that office was organized.¹⁶ It was through no fault of its own that the veterinary service, A. E. F., had not been properly organized at an earlier period of its history, but defects yet were such that they were not overcome until March, 1919.¹⁶

The adoption of Special Regulations, No. 70, War Department, 1917, marked the real beginning of the veterinary service, A. E. F. This new organization provided a simple, direct, and efficient mechanism for the evacuation of sick and inefficient animals from combatant forces to veterinary hospitals in the Services of Supply, where organized and specially trained units cared for them. From these Services of Supply hospitals the animals that were free from disease were evacuated to remount depots and thence returned to service. Animals which were not considered fit for treatment and eventual reissue were sold to butchers and civilians or killed to terminate their suffering. Some were employed in the Services of Supply.¹⁶

The veterinary hospitals were placed under command of veterinary officers, and steps were taken immediately to collect scattered companies and half companies of such hospitals into whole working organizations.¹⁶ The issue of convalescent animals from veterinary units back to organizations was stopped, and the policy of passing all convalescent animals through remount depots for reissue was instituted. The prompt rendition of weekly animal sick reports and their accurate compilation was insisted upon. Requirements were anticipated and reinforcements from the United States, already overdue, were cabled for. Further hospital accommodation was sought, and, with difficulty, an insufficient amount procured.¹⁶ These measures led to a material reduction in animal morbidity.¹⁶

The chief veterinarian, A. E. F., exercised direct jurisdiction over the activities of the veterinary service only in the Services of Supply; in the zone of the armies, administrative contact effected this through a veterinary officer with the fourth section of the general staff, G. H. Q.¹⁸ Through arrangements with the British and the French missions, an officer of the veterinary service of the British and French Armies was secured for liaison work.¹⁹ These officers were assigned to the office of the chief veterinarian, A. E. F.¹⁹

As finally organized, the office of the chief veterinarian comprised the following:¹⁹ The chief veterinarian; executive officer; one inspector; an administrative branch; a construction branch; a personnel branch; a statistical branch; liaison officers.

ORGANIZATION AND PERSONNEL

Tables of Organization, No. 331, December 31, 1917, prescribed for a veterinary hospital (capacity 1,000 patients) 7 veterinary officers, 1 medical officer, and 311 enlisted men. Tables of Organization, No. 109, February 12, 1918, fixed the strength of a corps mobile veterinary hospital at 2 officers, and

35 enlisted men. Tables of Organization, No. 330, March 10, 1918, prescribed for a mobile army (or for a base) veterinary hospital (capacity 500 animals) 4 officers and 144 enlisted men. Tables of Organization, No. 43, January 14, 1918, provided for each Infantry division 3 veterinary field units and 1 mobile veterinary section, the total personnel of this service for a division being placed at 12 officers and 51 enlisted men. Each division leaving the United States was to be accompanied by this contingent, part of whose members composed the units above mentioned while the others were assigned to division headquarters, brigades, Artillery regiments and trains.

The veterinary hospitals authorized for the American Expeditionary Forces were as follows:²⁰ Corps mobile veterinary hospital (evacuation) with 2 officers and 35 enlisted men; army mobile veterinary hospital (evacuation) with 4 officers and 144 enlisted men, and designed for 500 patients with half the equipment of a veterinary hospital; base veterinary hospital (stationary) with the same allowance of personnel and equipment as the preceding; and veterinary hospital (stationary) with 8 officers and 311 enlisted men. The last mentioned, which was the typical hospital for the service of the rear, had a normal capacity of 1,000 patients.

General Pershing's project for the rear called for the shipment of the foregoing units as follows: Corps mobile veterinary hospitals, 5; army mobile veterinary hospitals, 1; base veterinary hospitals, 2; veterinary hospitals, 26.

The phases under which the foregoing units were shipped are shown on page 209, Volume I of this history. Other units organized which reached France under an additional (October) phase consisted of corps mobile veterinary hospitals Nos. 7, 8, and 9.²¹

Veterinary personnel was also sent to France with 4 Cavalry regiments, 6 Engineer regiments, and 29 remount squadrons.²²

The 1st, 2d, 26th, 42d, 41st, and 32d Divisions left for overseas in the order mentioned before the veterinary personnel was fully assigned or the mobile sections organized, but the latter were assembled and sent over as a part of the first phase.²³

With the foregoing exceptions, veterinary organization of the first eight Regular Army, the National Guard, and the National Army divisions was accomplished at the station when each division was organized, and the veterinary units proceeded overseas with their respective divisions.²³

In April, 1918, the 132 veterinary officers available in France were quite able to meet all needs, but the situation was quite different in so far as enlisted men were concerned.¹⁶ The first two veterinary hospitals, comprising some 300 men each, arrived in France on April 4, 1918,¹⁶ the delay in their arrival being due to the same cause that delayed other Medical Department organizations; that is to say, shortage of tonnage and the necessity for giving priority to combatant troops.¹⁶ This shortage of men was somewhat relieved, however, by detailing certain squadrons of the remount service to assist the veterinary service.¹⁶

With some minor changes veterinary units organized in the United States in conformity with the project for services of the rear were sent to France as called for in the priority schedule.¹⁵

The following tabulated statement shows the veterinary hospital units and their enlisted strength which arrived in France between April 16, 1918, and January 1, 1919, with dates of embarkation from the United States and of demobilization:²³

	Number of veteri- nary officers	Number of enlist- ed men	Date of embar- cation	Date of de- mobili- zation
Veterinary hospital:				
1	6	300	1918 Apr. 16	1919 June 21
2	6	300	Mar. 28	June 20
3	6	300	May 15	June 12
4	6	300	Apr. 29	June 18
5	6	300	May 9	June 12
6	6	300	Mar. 28	June 19
7	7	300	July 26	June 25
8	7	300	do	June 26
9	7	300	do	June 24
10	7	300	do	June 22
11	7	300	do	June 19
12	7	300	do	Do.
13	7	300	Oct. 4	June 28
14	7	300	Oct. 8	Do.
15	7	300	Oct. 14	June 29
16	7	300	Oct. 28	June 26
17	7	300	do	July 6
18	7	300	Oct. 29	June 19
19	7	300	Oct. 21	Do.
20	7	300	do	Do.
21	7	300	do	July 5
25	6	141	Oct. 27	Jan. 26
Base veterinary hospital:				
1	4	144	Apr. 16	June 20
2	4	144	Oct. 28	July 5
Mobile army veterinary hospital:				
1A	2	72	July 26	(a)
1B	2	72	Oct. 28	(a)
2	4	144	Nov. 19	(a)
Corps mobile veterinary hospital:				
1	2	35	Apr. 18	(b)
2	2	35	July 26	July 5
3	2	35	Oct. 28	(b)
4	2	35	do	do
7	2	35	Nov. 22	Aug. 15
8	2	35	Nov. 23	June 30
9	2	35	Nov. 24	July 1
Veterinary replacement unit:				
1	13	200	Oct. 14	(b)
2	12	200	do	(b)
3	13	200	do	(b)
4	12	195	do	(b)

^a Absorbed in other units.

^b Absorbed.

As shown in the foregoing statement, several of the units were absorbed by other veterinary organizations in France, and never operated independently. They were demobilized with the units of which they had become a part.²³

In addition to hospital groups above listed, other personnel was sent over with divisions, corps, and army organizations, until the Veterinary Corps, A. E. F., reached a maximum of 890 commissioned officers and 9,701 enlisted men.²³ The latter were augmented by 2,000 labor troops who were assigned to this service, and at various times temporarily by several hundred men of the remount service.²³ There was no appreciable service diminution until April 1, 1919, when the veterinary service began to be gradually reduced and personnel sent to the United States for demobilization and discharge.²³

The following table shows the strength of the Veterinary Corps, A. E. F., as of various dates:

Date	Officers	Enlisted men	Date	Officers	Enlisted men
1917			1918		
Dec. 15.....	106	7	Nov. 2.....	728	5,166
1918			Nov. 16.....	802	5,505
Jan. 5.....	105	7	Nov. 30.....	854	8,152
Feb. 2.....	113	7	Dec. 7.....	857	8,275
Mar. 2.....	115	18	Dec. 28.....	890	8,970
Apr. 6.....	141	18	1919		
Apr. 20.....	191	596	Jan. 11.....	835	9,282
Apr. 27.....	203	597	Jan. 28.....	853	9,423
May 4.....	214	626	Feb. 1.....	850	9,458
June 1.....	262	1,042	Feb. 22.....	839	9,701
June 15.....	326	1,635	Mar. 1.....	832	9,661
June 29.....	353	2,101	Mar. 22.....	819	9,583
July 6.....	380	2,155	Apr. 5.....	778	9,527
July 20.....	421	2,246	Apr. 19.....	759	9,430
Aug. 3.....	443	2,482	May 3.....	700	9,257
Aug. 24.....	523	4,256	May 17.....	634	9,104
Sept. 7.....	555	4,413	May 31.....	551	8,560
Sept. 21.....	642	4,450	June 7.....	523	8,285
Oct. 5.....	678	4,612	June 13.....	451	6,192
Oct. 19.....	719	5,055	June 20.....	329	4,819

HOSPITALS

No real veterinary hospitals were established in France in 1917.²³ Such hospitals began to appear in the spring of 1918; so far as records go the first establishments were as follows:²³ No. 6, Neufchateau, April 16, 1918; No. 4, Carbon Blanc, May 4, 1918; No. 4, Camp de Souge (detachment from hospital), May 12, 1918; No. 10, Bourbonne-les-Bains, July 8, 1918; No. 8, Claye Souilly, August 8, 1918; No. 9, St. Nazaire, August 8, 1918; No. 7, Coetquidan, August 8, 1918.

When the Medical Department took over the veterinary service on August 29, 1918, there were in operation 11 hospitals, with a total capacity of 11,580 animals. Fifteen had been established, but some had been abandoned.²³

On November 1, 1918, there were in operation 15 veterinary hospitals throughout the different areas of the American Expeditionary Forces, but not all construction had been completed. The total animal capacity then available was approximately 12,000, but this was inadequate as many more cases than this number had to be cared for, thus necessitating the use of picket lines, corrals, paddocks, and other expedients.²³

After November 1, however, locations for veterinary hospitals were rapidly secured at Verdun, Longuyon, and Commercy, in the advance section, and construction was rushed to completion at Sougy and Lux, in the intermediate section.²⁴ Three thousand animals were turned in to the veterinary hospital at Verdun within 24 hours after the personnel arrived there for station in December, though the accommodation of the veterinary hospital there was for less than 1,700 animals.²⁴

A determined effort was made to locate new hospital sites and have more labor troops assigned to Veterinary Corps to aid in evacuation and care of sick animals until the veterinary hospital personnel which were on the water or cabled for would arrive.²⁵

On November 11, 1918, one army mobile veterinary hospital was in service of the First Army, where it had been for several months,²⁶ and another in that of the Second.²⁷ At this time mobile veterinary hospitals which had been provided for the First, Second, Third, Fourth, and Seventh Corps, were either assigned or available; furthermore, a mobile-veterinary hospital for each of the three other corps was on the shipping program.²⁷ Twenty-one veterinary hospitals and two base veterinary hospitals were provided in the Services of Supply, and 10 other veterinary hospitals and 1 other base veterinary hospital were on the shipping program or in process of organization in France when the armistice was signed.²⁷

When the Third Army moved to the Rhine, locations were secured for veterinary hospitals at Coblenz and Treves, and personnel to man them was rapidly pushed forward.¹⁹ Stables of knock-down type for 10,000 animals were held in readiness at Verdun for shipment to the Third Army if required.¹⁹

Location of the principal veterinary hospitals, American Expeditionary Forces, during operations, with the approximate animal capacity of each:²³

Location	Animal capacity	Location	Animal capacity
St. Nazaire.....	3,000	Jeanne d'Arc.....	1,000
Coetquidan.....	2,160	Neufchateau.....	1,700
Carbon Blanc.....	950	Claye Souilly.....	1,200
Camp de Souge.....	1,000	Bourbonne-les Bains.....	1,250
Gievres.....	2,000	Commercy.....	750
Nevers.....	1,000	Lux.....	700
Neuilly L'Eveque.....	1,200	Longuyon.....	1,200
Triconville.....	1,350	Verdun.....	2,000
Treveray.....	1,000	Grosrouvres.....	300
Valdahon.....	1,300	Woinville.....	300

Veterinary hospitals were established also at Toul, Meucou, Epinal, Sougy, and Treves, in the zone of the armies.²⁸

The maximum number of veterinary hospitals, exclusive of those with the armies, was 21. The total capacity of these hospitals was 27,614 animals.²⁸

On March 1, 1919, there were 20 veterinary hospitals in operation, exclusive of army veterinary hospitals with an animal capacity of 26,664, and containing about 20,000.²³

After April 1, 1919, the capacity of veterinary hospitals was gradually reduced, and by May 1, 12 veterinary units had been placed on the priority list for return to the United States, and all labor troops had been relieved from duty with the veterinary service.²⁹ Only 8 hospitals were then in operation, containing about 4,000 animals. The hospitals could have been evacuated more rapidly but for the fact that the remount depots were receiving animals from troops that were returning home and were crowded to capacity.²⁹ Therefore animals were held at hospitals until they were in a salable condition.

After June 20, 1919, demobilization proceeded very rapidly and by September practically all members of the veterinary service had been returned to the United States except such as were designated for duty with the American forces in Germany.²³

SUPPLY OF ANIMALS

Much of the embarrassment of the veterinary service was due not only to inadequate personnel but also to the overcrowded condition of the hospitals, which in turn resulted from the fact that replacement animals were not available in sufficient numbers at any time prior to the armistice to permit early evacuations of animals moderately incapacitated. This caused great numbers to become totally incapacitated, required hurried evacuation, and necessitated relatively prolonged treatment.²³

In July, 1917, the French agreed to furnish our forces with 7,000 animals a month; accordingly, the War Department was requested to discontinue shipments.²⁷ However, on August 24, 1917, the French advised us that it would be impossible to furnish the number of animals originally stated, and the War Department was again asked to supply animals, but none could be sent over until November, and then only a limited number.²⁷

Up to July, 1918, relatively few horses belonged to the American Expeditionary Forces.¹⁶ When it was decided to hasten the departure of American troops to France, the prevailing shortage of ship tonnage made it impossible to transport with troops their full complement of horses. As a result, in April, 1918, although there were six divisions of the American Expeditionary Forces in France, they had (including all animals in remount depots) only 55,378 animals.¹⁶ It had been hoped that horses could be obtained in Europe, but the supply proved altogether insufficient, and consequently what horses the American Expeditionary Forces had were overworked, contracted a large amount of contagious diseases, and rapidly became inefficient through sickness, with a high mortality.¹⁶

Early in 1918, after General Pershing's personal intervention and much delay, the French Government made requisition on their country and we were able to obtain 50,000 animals.²⁷ After many difficulties, the purchasing board was successful in obtaining permission in the summer of 1918 to export animals from Spain, but practically no animals were received until after the armistice was signed.²⁷ Sound animals sent up from depots were soon infected in divisional areas.²⁶

Because of the shortage of veterinary surgeons in the American Expeditionary Forces, no officers of that corps were available for the inspection of some 30,000 of the animals purchased; a result of this situation was the inclusion of a great many diseased horses among those thus procured.²³ Every effort was made to reduce animal requirements by increased motorization of artillery and by requiring mounted officers and men to walk, but in spite of all these efforts the situation as to animals grew steadily worse. The shortage by November 1, 1918, exceeded 106,000, or almost one-half of all our needs. To relieve the crisis in this regard, during the Meuse-Argonne operation, Marshal Foch requisitioned 13,000 animals from the French armies and placed them at the disposal of the American Expeditionary Forces.²⁷

EVACUATION OF SICK AND WOUNDED ANIMALS

The system of animal evacuation adopted by the American Expeditionary Forces, and promulgated in General Orders, No. 39, H. A. E. F., September 18, 1917, was similar to that employed by the British veterinary service.²³ In

this order it was prescribed that the veterinary service should operate as follows: Animals with organizations of the army that were wounded or had become unserviceable were to be taken over by mobile veterinary units and delivered to the nearest veterinary hospital. The organizations from which these unserviceable animals were taken were to requisition on the nearest corps remount depot for the animals needed to replace those turned over to the Veterinary Corps, and the corps depot was to deliver to the organizations the animals asked for. The corps remount depots were to be kept filled by transfers of animals from the Army depot which was to keep its quota of animals by requisition on the advance or base depots. All remount depots were to receive at any time any animals that had been cured of disease or that had recovered from wounds at veterinary hospitals. In short, the remount service was to keep organizations supplied with serviceable animals and the veterinary service was to relieve organizations of the care of all sick or unserviceable animals.

There was no intrinsic reason why this plan should not have worked successfully provided it was completely developed. It was merely an outline of the plan of supply and evacuation, and since there was neither provision for administrative veterinary officers nor for the close coordination of the different parts of the veterinary service, inevitably there developed under General Orders, No. 39, H. A. E. F., 1917, one veterinary service functioning under the remount service, and one in each division, all operating quite independently.²³ Also, no corps or Army veterinary service was provided for in connection with moving troops, nor was there any arrangement for coordination of the services in the base, intermediate, and advance sections.²³

The need of an organized veterinary service in the army zone became strikingly apparent during the Aisne-Marne operation in the summer of 1918.¹⁹ In the First and Third Corps, which participated,³⁰ no uniform system for the evacuation of disabled animals had been provided for, and each of the constituent divisions operated its veterinary service independently, caring for its animals and disposing of them on its own initiative and as best it could.²⁶ This lack of coordination in these two corps entailed a great loss of animals. In the First Corps a corps veterinarian was appointed who organized a corps mobile hospital of 2 officers and 35 men, augmented by a troops of Cavalry.²⁶ It is noteworthy that this organization collected disabled animals from the divisions of the corps and prepared plans for their subsequent shipment to the rear, thus being our first attempt to carry out a systematic plan for the evacuation of disabled animals.²⁶

FIRST ARMY

In the plans for the organization of the staff of army and corps, First Army, no provision had been made for a veterinary staff service, but as the necessity for such service was now recognized, an army veterinarian was appointed for the First Army when that force was organized.²³ This officer operated under the remount service until the veterinary service was transferred to the Medical Department, August 27, 1918.

During the earlier operations evacuations of animals were effected in the First Army as follows: ²³ Division mobile veterinary sections, located at the most accessible points for receiving animals from divisional units, received and prepared all cases for evacuation. Here first aid was given; the mallein test was administered; if necessary, animals were shod; if in a hopeless condition, they were destroyed to prevent suffering. From the divisional collecting points they were transported overland by the mobile veterinary sections to the receiving points of corps mobile veterinary hospitals where they were classified, given first-aid treatment as at divisional points, and in turn evacuated to the army mobile veterinary hospitals. These units were charged with the temporary care of animals and their shipment to Services of Supply hospitals.

At first, the use of railheads for the evacuation of sick animals was refused by the First Army, without reference to general headquarters, A. E. F.²⁴ Thus hundreds of animals debilitated and sick, often suffering from serious wounds, were lost, through being evacuated long distances overland; literally thousands were retained with divisions through the inability of the veterinary personnel to cope with the requirements of long overland evacuation.²³ Eventually, the necessity for evacuating by railroad was conceded, but for a time another difficulty obtained.²³ Instead of the activity being considered a veterinary one, it was placed directly under G-4 of the army; consequently, this portion of the evacuating mechanism being out of the control of the army veterinarian, adequate arrangements could not be made by him to send trainloads of sick animals to the hospitals prepared to receive them.²³ Instead, animals to be evacuated were sent to hospitals deemed most suitable by G-4 of the army, the personnel of which did not always possess adequate knowledge of the receiving capacity of such hospitals. Presently this obstacle was removed, however, and veterinary evacuating hospitals (sections) commanded by veterinary officers, took over the evacuated animals from divisions and moved them by railroad to allotted hospitals.²³

About October 1, 1918, two army evacuating units were placed forward near advanced railheads to carry on the work of receiving sick animals direct from the divisional mobile veterinary sections and attend to their evacuation, the corps units being taken over and consolidated with those of the army.²³ This proved of great advantage and was the means of saving the lives of many animals that otherwise would have perished on the way to the rear under the operation of the former system.

Because of the great shortage of replacements necessary to keep up the animal strength of organizations, the evacuation of inefficient animals, unless totally disabled, was impossible during active operations.²³ This circumstance in turn caused many animals to be returned which should have been evacuated earlier.

Failure to provide animals for replacements during active operations was a most important factor in the increase in the number of sick.²² It happened repeatedly that the recommendation of veterinarians concerning the evacuation of unfit animals was opposed by unit commanders, who protested that sick and emaciated animals were better than none and that the activities of their units would be crippled or wholly suspended unless the sick animals were retained or

replaced.²² Consequently, animals were worked until they starved to death, died in harness or were in such condition that when evacuated they could not be cured.²² Also under these conditions mange spread so rapidly that the entire animal strength of some organizations was affected.²² Inevitably there were great losses which could have been averted had replacements been available.²³ The retention of inefficient animals within combatant units hindered in no small measure the mobility and efficiency of organizations operating on the front line. Not until after the armistice began did these units fail to show hesitancy in evacuating incapacitated animals, and then sick animals long retained in divisions were thrown in large numbers upon the veterinary service for evacuation and treatment. Upon the removal of a great percentage of the sick, the efficiency of the animals left was markedly increased.²³

Adequate provisions could not be made for the flow of evacuations that ensued after the St. Mihiel and Meuse-Argonne operations, and, as a result, the veterinary hospitals were greatly undermanned and overcrowded.¹⁹ Sick animals had been so long retained with divisions, that their evacuation in bulk, although absolutely necessary, threw great strain on all veterinary hospitals, and some of them perilously approached collapse.³¹

The large number evacuated at this time is indicated by the fact that, in 24 hours, 3,000 animals were evacuated to the veterinary hospital at Verdun where the stable capacity was only 1,625.²³ Fortunately, 10 veterinary hospitals were at sea or under orders to embark, and until sufficient veterinary personnel became available labor companies and remount squadrons were temporarily detailed to assist these hospitals. However, even with this increase of resources there was not sufficient personnel to meet the situation fully.²³

An efficient veterinary service which gradually brought the animal efficiency of the American Expeditionary Forces to a standard comparable with that of the Allies was not reached until after the armistice was signed.²³

The following figures pertaining to the First Army indicate to a degree the scope of its veterinary service:²³ Animals evacuated, 11,507; died, 2,037; destroyed, 1,334; killed in action, 734. The highest number of animals of the First Army was 93,032, while the average strength was 8,841. Mange and debility caused the majority of the evacuations from the First Army.

SECOND ARMY

The Second Army evacuated its disabled animals to a veterinary hospital established at Toul, whence some animals were sent to other veterinary hospitals in the Services of Supply.²³ When the Second Army was organized October 10, 1918,³² it was not intended that it should at once undertake a vigorous operation. It had a relatively quiet sector, and was preparing for an offensive which began three days before the armistice was signed and was terminated by that event.²⁷

At this time advanced Veterinary Hospital No. 5 was stationed at Jeanne d'Arc Caserene, near Toul.²³ This unit had been utilized by the First Army during the St. Mihiel operation. It now passed to the control of the new army and was used as a receiving station for all evacuations from the Second Army area. From this point, after a rest, the animals were shipped to Services of

Supply hospitals. Shortly before the armistice began the veterinary hospital at Jeanne d'Arc Caserne was taken over by the advance section, and two army mobile veterinary hospital units were assigned to take care of Second Army evacuations. These were placed at the advanced railheads and were ready to function in the military operation about to take place; however, owing to the cessation of hostilities they did not operate in the manner planned except to receive and evacuate sick animals from organizations held in the area awaiting orders for movement to the rear. These evacuating units were retained at the points where they were originally located and were used for the establishment of temporary hospitals until the Second Army as such passed out of existence.²³

As in the First Army, most of the losses and incapacity of animals in the Second Army were due to the ravages of mange and to improper care.²³ Replacements being difficult to procure, organizations were loathe to give their animals up in the early stages of disease; consequently, they were held until so emaciated and diseased as to be a constant menace to the other animals of the command.²³

The following tabulation indicates the extent of veterinary operations of the Second Army:²³

Greatest animal strength.....	30, 391
Average animal strength.....	12, 007
Number of animals evacuated.....	6, 219
Number killed in action.....	146
Number wounded by shrapnel and high explosives.....	385
Number died from debility and exhaustion.....	207
Number died from other causes.....	298
Number missing in action.....	27

Evacuation of animals from the Second Army was limited to a minimum because the crowded condition of the Services of Supply veterinary hospitals made imperative the treatment of large numbers of animals within their organization. Approximately 30,000 animals were dipped between February 1 and April 10, 1919, and large numbers of others in divisional units were hand treated by sprays.²³

THIRD ARMY

In order to provide sufficient animal strength for the Third Army, it was ordered, before the march into Germany, that the divisions of the First and Second Armies not designated as part of the Third Army turn over a sufficient number of serviceable animals, free from disease, to units of the Third Army, and evacuate all sick and unserviceable animals for transfer to veterinary hospitals.²³ This naturally caused a great increase in the number of animal evacuations and consequent congestion of veterinary hospitals.²³

On the march into Germany no adequate provisions were made for caring for sick and disabled animals; therefore, animal losses were heavy.²³

In this army also, mange became one of the most important diseases, and it was not long before a large percentage of its animals were affected.²³ The seriousness of the situation was soon evident, however, and dipping vats were established throughout the army area, clipping of the animals was instituted, and all animals were dipped regularly. By pursuing this method of treatment,

it was but a short time before the mange situation was well in hand. The number of animals dipped exceeded the total number of animals, for many of them were treated several times in this manner.²³

Statistics concerning operations of the Third Army from December 24, 1918, to June 1, 1919, are as follows: ²³

Greatest animals strength.....	54,782
Number of animals evacuated.....	6,504
Number admitted to Third Army hospitals.....	3,326
Number sold from hospitals.....	1,141
Number turned over to remount depots.....	862
Number died.....	1,199
Number destroyed (mostly for butchering).....	1,716
Greatest number of mange cases reported (Feb. 14, 1919).....	9,000
Number of animals dipped.....	54,782

Subsequent to August 27, 1918, when such data became available, 317,690 animals were admitted to sick report.²³ Of these, 105,019 were admitted for mange, 21,153 for influenza, 2,079 for pneumonia, 549 for epizootic cellulitis. Mallein tests for glanders numbered 948,065; 9,122 doubtful cases were retested; 2,721 animals were destroyed by reason of glanders. The number of animals transferred from one hospital to another was 71,043; 197,690 animals were restored to duty after treatment; 17,585 died after being taken over by the veterinary service. Total losses to August 31, 1919, were 63,369.²³

The total losses from deaths and missing constituted practically 26 per cent of all animals supplied the American Expeditionary Forces.²³ After the Veterinary Corps was placed under the Medical Department the number of deaths among animals amounted to 17,585, as contrasted with 41,373 deaths which occurred while the corps operated under the remount service.²³

After April 1, 1919, when animals had been placed in salable condition, they frequently were sold to French civilians, by some officer of the remount service who visited the hospital in order to conduct this sale.²⁹ After that date surplus animals were also disposed of under an agreement with the French Government by which those in good health were to be taken over and sold at auction in the various French regions and the proceeds of sale, less 5 per cent, were to be turned over to the American Government.²³

In veterinary hospitals all animals which would not be fit for service in two months were inspected and condemned, and turned over to the French at a fixed price of 450 francs.²⁴ If too weak to be removed from hospital they were sold for butchery purposes.

INFECTIOUS DISEASES

MANGE

Mange caused great havoc in the animal efficiency of the armies in western Europe.²³ Its eradication under war conditions was impossible, but the British Army demonstrated that, with proper care, by the adoption of strict sanitary precautions and the prompt evacuation and treatment of animals affected, it could be kept well under control.²³ In that army the number of cases under treatment was reduced from 20,000 in July, 1916, to approximately 2,000, two years later.²³

On February 15, 1919, animal sickness in the American Expeditionary Forces reached its maximum for the whole period of operations, 48,975, or about 21 per cent of the total number of animals then on sick report.²³ Of this number, 30,756, or about 16 per cent, of our animals were suffering from mange. Such energetic measures were taken to remedy the situation that the number of cases rapidly diminished, and, on March 1, 1919, but few active cases of mange were to be found.²³

In the First Army the method of treatment was by the use of sulphur chambers, which proved effective.²³ The method of treatment in the Second Army involved the use of dipping vats.²³ In addition to dipping, however, great numbers were successfully treated in organizations by the use of hand sprays. The standard lime and sulphur dip was the agent used for treatment in either case.²³

INFLUENZA

Influenza took heavy toll of both animals and animal efficiency during the early operations of the American Expeditionary Forces. This condition was inevitable, for at this time all veterinary hospitals were operated in conjunction with remount depots, and sick and well animals intermingled with but little opportunity for segregation. Furthermore, fresh remounts purchased from the civilian population were often sent direct to combat organizations without preliminary training to harden them for active service. Therefore, great numbers of these animals perished from influenza or its complications and those which recovered were left in so weak and emaciated a condition that, being of little value for service, they had to be evacuated at the earliest opportunity.

GANGRENOUS DERMATITIS

Generally speaking, gangrenous dermatitis was the cause of the great prevalence of such foot diseases, variously classed on sick report, as quittor, canker, pododermatitis.²³ Caused by the *Bacillus necrophorus*, which existed in the soil everywhere in France, it only became necessary for the standings and roads to become muddy to cause its rapid spread. No records are available showing the number of cases of this infection, for such cases were classed under diseases of locomotion; but it is beyond question that this disease caused a large percentage of deaths and disabilities.²³

GLANDERS

In former wars glanders had been the disease most dreaded, and the most reducing of animal strength, but in the World War its ravages were held at a minimum.²³ This was due to the perfection of mallein and its practical application in recent years, thus enabling veterinary officers to detect the disease in its incipient stages. Three different practical field tests were available: The ophthalmic, thermal, and intradermic (termed the intrapalpebral in the American Expeditionary Forces).²³

The intradermic test was the one adopted by the Veterinary Corps of our own and the allied armies, and it proved the most simple and efficacious for field service when its technique was properly understood.²³ Many of our

veterinary officers were not at first acquainted with its technique and, undoubtedly, some cases of glanders escaped their attention in the beginning of our operations.²³

Following the appointment of a chief veterinarian, A. E. F., in July, 1918,³³ instructions were given to test all animals at least once a month.³⁴ This test was carried out to the extent required in so far as it was possible under existing conditions, and no doubt was the means of reducing the spread of glanders to a minimum.²³ It is worthy of note that never was there any great outbreak among the combat organizations at the front, although glanders gained considerable headway in some of the veterinary hospitals.²³

The weekly report on glanders showed an average of six cases per week up to November 23, 1918, when, for the week ending on this date it suddenly increased to 34 cases.²³ Early in 1919, the chief veterinarian, A. E. F., on investigation, found that some veterinary officers did not understand the test through lack of proper instruction in technique. Instructions were sent out by him immediately, stating the manner of administering and reading the test, and were later supplanted by a bulletin from general headquarters, A. E. F.³⁵

In addition to instructions being distributed, officers thoroughly familiar with the test were sent to all units in the American Expeditionary Forces to demonstrate the intradermic test to veterinarians.²³

Because of the prevalence of glanders in our veterinary hospitals, the chief veterinarian, A. E. F., held at St. Nazaire on January 7, 1919, a conference of veterinarians to formulate rules for the administration of the intradermal test and for the technique in reading reactions.²³

To confirm tests previously made, further tests, both intradermic and laboratory, and post-mortem examinations were made in a large number of reacting animals which had been killed.²³ The results were noted to confirm the reactions previously given. After a study of the results, recommendations were submitted to general headquarters, A. E. F., on February 25, 1919. These recommendations gave full instructions in administering tests, and in combating outbreaks of glanders, together with sanitary precautions necessary to prevent contraction of the infection by sound animals.

The more accurate tests required were followed by an immediate increase in the number of cases reported, the report for the week ending January 18, 1919, showing 391 cases, but, from this date the number reported declined rapidly. Only 44 cases were under treatment on March 1. The week ending April 19, showed only 6 cases, and at this time the glanders situation was believed to be well in hand. When the task performed by the Veterinary Corps in controlling glanders and the difficulties confronting it are considered, the number of cases destroyed does not appear excessive. Such cases were 2,721, or approximately 1 per cent of all animals supplied to the American Expeditionary Forces.²³

NONINFECTIOUS DISEASES

DEBILITY

Debility, while not properly classed as a specific disease, is worthy of some consideration in connection with a study of the animal morbidity of the American Expeditionary Forces. This condition was the result of various

causes, such as the after effects of influenza, mange, overwork, lack of food and water, improper grooming, delayed evacuation.²³ Wastage from this cause alone figured largely in animal losses, but unfortunately no accurate data can be formulated concerning it.²³

DIGESTIVE DISORDERS

The losses from digestive disorders, although not excessive, were considerable.²³ These maladies were usually due to conditions of the forage. Moldy forage often had to be accepted because of the absence of other reliable feed.²⁴

QUARANTINE OF PUBLIC AND PRIVATE MOUNTS FOR RETURN TO THE UNITED STATES

A quarantine for 66 private and 54 public mounts was established at Camp de Souge (Gironde) on May 1, 1919, for animals designated for return to the United States.²³ The quarantine was to cover a period of 90 days in France and to be continued for the same period in the United States. This was subsequently changed to 30 days in France and 150 days in the United States, including time in transit. On account of overcrowding on the transports bringing the animals to the United States, the quarantine regulations unavoidably were broken, and it became necessary to retain such animals for the full period of 180 days from the date of arrival in this country. The quarantine in France was to start on May 15, 1919, the date set for the receipt of the last animal, but this was later changed upon request from the office of the chief surgeon, A. E. F., and the time limit fixed for August 20, 1919, although base section No. 2 was officially closed before this date. For this work there were assigned 5 officers and 144 enlisted men, Veterinary Corps.²³

The importance of this quarantine can not be fully realized unless it is taken into consideration that the animals in question had been exposed to all classes of infectious diseases incident to the war. Some of these diseases had never existed in the United States and for this reason most careful and rigid quarantine regulations were formulated by the veterinary division of the Surgeon General's office in connection with and accordance with recommendations made by the Department of Agriculture.²³

PERSONNEL ^a

(July 28, 1917, to July 15, 1919)

Col. Berkeley T. Merchant, Cav., chief.

Col. D. S. White, V. C., chief.

Lieut. Col. Harold E. Bemis, V. C.

Maj. George R. Powell, V. C.

Capt. Horace Z. Homer, V. C.

First Lieut. Theodora C. Beechwood, V. C.

First Lieut. Will W. Korb, V. C.

Second Lieut. Maurice E. J. Evans, V. C.

^a In this list have been included the names of those who at one time or another were assigned to the division during the period July 28, 1917, to July 15, 1919.

There are two primary groups—the heads of the division or the section and the assistants. In each group names have been arranged alphabetically, by grades, irrespective of chronological sequence of service.

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- (3) Cablegram No. 177, par. 14, from General Pershing to The Adjutant General, for the Surgeon General.
- (4) G. O. No. 108, W. D., October 30, 1917.
- (5) Memorandum from Maj. L. A. Klein, V. C., for the chief surgeon, A. E. F., December 27, 1917. Subject: Organization of the veterinary service, A. E. F. Copy on file, Historical Division, S. G. O.
- (6) Memorandum for the chief surgeon, A. E. F., Col. J. A. Logan, chief of the administrative section, general staff, G. H. Q., A. E. F. December 23, 1917. On file, Historical Division, S. G. O.
- (7) Letter from Maj. L. A. Klein and A. L. Mason, V. C., to the Surgeon General, March 29, 1918. Subject: Veterinary service, A. E. F. Copy on file, Historical Division, S. G. O.
- (8) Letter from the Surgeon General to the chief surgeon, A. E. F., January 5, 1918. Subject: Organization of the veterinary service. Copy on file, Historical Division, S. G. O.
- (9) Cablegram No. 677 from The Adjutant General to General Pershing, January 21, 1918.
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- (24) Report of the chief veterinarian, A. E. F., undated, made to the chief surgeon, A. E. F. On file, A. G. O., World War Division, chief surgeon's files, 314.7.
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SECTION II

MEDICAL ACTIVITIES OF TERRITORIAL SECTIONS

The territorial sections, A. E. F., may be divided roughly into two classes: Those built around the ports (or base sections), and the interior sections. There were 11 territorial sections; however, for present purposes, 3 sections only are considered the advance section (an interior section), and two base sections (Nos. 1 and 5).

THE ADVANCE SECTION ^a

The advance section, located in the north and northeastern part of France, embraced in a general way the territory north of Paris, and Dijon. Its geographical limits, as prescribed by General Orders, No. 75, Headquarters, A. E. F., December 14, 1917, included the Departments of Nord, Pas du Calais, Somme, Oise, Aisne, Ardennes, Marne, Merthe et Moselle, Meuse, Haute Marne, Cote d'Or, Vosges, Haute Saone, and Doubs. These limits were somewhat changed from time to time.

At Chaumont, in this section, which was that immediately behind the front, general headquarters of the American Expeditionary Forces were located after September 1, 1918. The section also contained 22 training areas where tactical divisions were billeted, either on their way to the front or for rest, replacement, or refitting. In addition to these were the training area where Medical Department troops were trained, the staff and line schools of all branches of the service, the supply depots, and other installations of the technical services, including 63 hospitals and 10 veterinary hospitals. Despite the fact that practically all of these areas and formations were under direct control of either general headquarters of the American Expeditionary Forces, or headquarters, Services of Supply, the number of troops under the jurisdiction of the section commander sometimes amounted to more than 200,000. The section had been organized to extend the jurisdiction of the commanding officer, Services of Supply, up to the points where supplies would be delivered to the field transportation of combat forces, but in practice distribution was made from regulating stations which were under the direct control of the general staff, general headquarters.

Headquarters of the advance section were located at Neufchateau, where the office of the section surgeon was opened on November 1, 1917.

The office of the section surgeon had three principal divisions: Administration, sanitation, and dental service.

In respect to administration, the duties of the section surgeon were analogous to those of a department surgeon, but were much greater, as they included the sanitary service of many camps and the control of a number of Medical Department units—ambulance companies, field, mobile, and evacua-

^a The statements of fact appearing herein are based on: "Report of the surgeon, advance section, A. E. F." (undated), by Col. F. P. Reynolds, M. C. On file, Historical Division, S. G. O.

tion hospitals, medical supply depots, sanitary squads, and laboratories. The frequent changes in these commands necessitated a corresponding increase in the activity of the section surgeon's office. Another difficulty with which he had to contend was the fact that, as a number of formations within the area were exempted from control of the section commander, there was a certain lack of coordination in the medical service of all the commands located within its geographical limits. These exempted areas were schools, regulating stations, supply depots, base hospitals, roads, and other projects. On January 31, 1919, the number of Medical Department personnel carried on the records of this office was as follows: Officers, 1,456; nurses, 500; enlisted men, 14,413. Medical supplies were at first issued from the supply depot without the approval of the office of the section surgeon. Shortly after the armistice began this arrangement was modified so that requisitions for medical supplies required his approval before issue from the depot was made.

For sanitary service the section was divided into areas, in each of which a local sanitary officer was designated, all under the supervision of the section sanitary inspector. To each divisional training area a sanitary squad was assigned and its commanding officer was charged with the duties of sanitary officer for the area. Each divisional training area included a sufficient number of towns, usually a score or more, to accommodate a full tactical division, the troops occupying houses, barns, or other outbuildings and newly constructed barracks. For administrative purposes a zone major and three or four assistants were assigned to each training area where they were under the direction of the chief billeting officer of the advance section. The zone major assigned brigades to groups of towns; in each occupied town a town major was appointed by the commanding officer of the unit. The general instructions to the zone major directed him to organize and administer his zone to accommodate the unit assigned to it, his primary duty being to provide for the comfort of troops occupying the towns of the zone.

The average towns with which this section was concerned had grown from hamlets and villages without corresponding increase of wealth, for which reason few streets were paved, lighting was most primitive, and sewerage systems generally were lacking; public bathhouses took the place of private baths. Street filth was common in the village of eastern France because of lack of labor and the fact that most of the villagers were farmers, who saved all manure to spread on their lands. When the Americans first entered these villages, with their long main streets lined with manure piles, they at once set to work cleaning up. The result was often a misunderstanding. The rooms used by our troops were paid for at an agreed rate, 2 square meters of floor space being allowed for each man. The sanitary arrangements of the towns were primitive and unsatisfactory to Americans, but were gradually improved. In the end, they were fairly good; at least the billets proved healthful to the troops occupying them.

The general plan for sanitary work in a training area was: (1) To keep the zone major constantly informed of sanitary conditions; (2) to estimate the billeting capacity of each town in order that the troops might have proper air space and comfort; (3) to work in conjunction with the central Medical De-

partment laboratory in placarding water sources; (4) to assist incoming units in preventing epidemics; (5) to assist in organizing and operating bathing and disinfesting stations; and (6) to exercise a general supervision over the sanitary conditions among the civilian population. When the training areas were not occupied by divisions it proved desirable to assign trained men from sanitary squads on duty in those areas to temporary duty elsewhere with organizations recently arrived from the United States and whose medical personnel were unfamiliar with special sanitary conditions and problems in France.

Following the signing of the armistice and the return of combat divisions from the front to training areas, the work of the sanitary squads was mainly that of assisting the divisional sanitary inspectors in promoting bathing and disinfestation of troops and in improving the sanitary conditions in the towns.

Weekly reports of activities of the sanitary squads were rendered to the zone majors and to the surgeon of the advance section.

The medical and sanitary services of troops in each training area were handled by the surgeon and sanitary inspector of the division occupying it. These officers were assisted by a sanitary squad of 26 men. A medical officer was located in each town of any size but the sick requiring hospital treatment were sent to the camp hospital of the area; the more seriously sick were evacuated to base hospitals from the area railhead.

It was difficult and often impossible to maintain safe or satisfactory standards of sanitation in camps and training areas. Overcrowding in barracks and billets was the most serious defect, due chiefly to lack of buildings and of building material, and transportation. This condition may be said to have been the chief determining factor in the spread of respiratory infections, notably influenza, pneumonia, diphtheria, meningitis and tonsillitis, which prevailed at times, in many places.

Difficulties were experienced in providing adequate facilities for bathing and for drying clothing, with ensuing hardship to the troops. Water supplies, in many instances, were inadequate in quantity, while in quality they generally were unsafe for drinking purposes. Gross pollution was by no means uncommon, and many outbreaks of diarrhea were traced to this cause. The food of the men was ample in quantity and excellent in quality, so that complaints on this subject were few and of minor importance. The same may be said of clothing. A scarcity of blankets was reported in some organizations in October and November, 1918, but this was soon corrected.

Investigations of outbreaks of communicable diseases were made by special inspectors from the office of the advance section surgeon. Often these investigations were carried on in connection with the central Medical Department laboratory and Army laboratory No. 1, both of which were located in the advance section. The facilities of these laboratories were also utilized for the analysis of water supplies and for other chemical and bacteriological work. They were supplemented especially for clinical purposes by the laboratories in camp and base hospitals.

Much difficulty was experienced in making effective measures for the supervision and control of the venereal diseases. The constant movement of troops on their way to and from the front, the lack of control by headquarters

of the advance section over many of the organizations, and the wide distribution of the troops under its command conspired to make difficult the prosecution of a comprehensive plan. The number of separate camps or stations of troops was over 400. Many small detachments were located in isolated localities, with which it was difficult, if not impossible, to communicate by mail, telegraph, or telephone. Changes in stations of troops occurred so frequently that headquarters of the section was never able to maintain an accurate record in its weekly station list.

The great shortage of medical personnel and of transportation which existed until some time after the signing of the armistice further interfered to a serious degree in this as well as in other sanitary activities.

As a rule, the health of troops in billets was exceptionally good; better than when they occupied crowded barracks, and on the whole was satisfactory. The epidemic of influenza which prevailed during August, September, and October, 1918, constituted the most serious outbreak of communicable disease, for some organizations suffered very severely, and in certain camps, notably at Valdahon, the epidemic assumed a grave aspect. Influenza continued to constitute the principal cause of admission to hospitals to the end of 1918 and isolated outbreaks occurred until March of 1919. After the autumn months the cases of influenza were less severe and their complications, especially pneumonia, were less frequent. Typhoid fever appeared in many places, and in a number of combat organizations there were well-marked outbreaks. Among troops properly pertaining to the advance section, the cases were scattered, with a single exception, when 15 cases occurred in one camp. The development of these cases occasioned a new administration of typhoid prophylactic. Cases of cerebrospinal meningitis occurred in many organizations. By January, 1919, 32 central reporting officers were collecting morbidity reports from troops in their areas, which they sent in weekly by telephone or telegraph.

A total of 26 camp, mobile, and evacuation hospitals were in operation in this section, with approximately 9,000 beds. The personnel of camp hospitals were assigned by the surgeon of the section approximately in the proportion of 10 medical officers, 10 nurses and 25 enlisted men to each of these units. Each camp hospital served a division of from 25,000 to 30,000 men.

The following camp hospitals operated in this section: No. 1, Gondrecourt; No. 3, Bourmont; No. 4, La Fauche; No. 6, Barisey-la-Cote; No. 7, Humes; No. 8, Montigny-le-Roi; No. 9, Chateau-Villain; No. 10, Prauthoy; No. 12, Valdahon; No. 13, Mailly; No. 18, Liffol-le-Grand; No. 21, Bourbonne-les-Bains; No. 22, Langres; No. 23, Langres; No. 24, Langres; No. 38, Chatillon-sur-Seine; No. 41, Is-sur-Tille; No. 42, Bar-sur-Aube; No. 48, Recy-sur-Ource; No. 49, Laigness; No. 50, Tonnerre; No. 64, Semur; No. 65, Semur; No. 67, Monetaeu; No. 97, St. Dizier; No. 100, Belfort. Evacuation hospitals in the area were the following: No. 1, Toul; No. 2, Baccarat; No. 10, Froidos; No. 114, Fleury-sur-Oise. Mobile hospitals were two in number; No. 10, Vitry; No. 11, Donjeux.

On the breaking up of the First and Second Armies the following medical units of these armies and unattached to divisions came under control of the

advance section—4 evacuation hospitals, 3 field hospitals, 1 sanitary train, and 15 ambulance companies.

In the spring of 1919 disbandment of medical organizations in the advance section went on rapidly. By April 1, Camp Hospitals Nos. 1, 3, 7, 8, 9, 10, 21, 38, 42, 49, 60, 67, and 97 had ceased to function. The evacuation hospitals, field hospitals, and ambulance companies mentioned above were also ready to move to the ports. Twenty-three sanitary squads had finished their labors.

BASE SECTION NO. 1^b

Base section No. 1 was located on the west coast of France, bordering the Bay of Biscay and surrounding St. Nazaire. This was the first port used for debarkation purposes. This section, after several changes, embraced the departments of Morbihan, Loire Inferieure, Vendee, Maine et Loire, and Deux Sevres. As St. Nazaire lay at the mouth of the Loire, the main route to the American Army at the front led up the valley of this river. The port had excellent wharves, with water deep enough for the majority of transports, but its harbor was small and in consequence only a limited number of ships could be accommodated at one time.

The office of the surgeon of this section was established at St. Nazaire on July 2, 1917, immediately after the arrival of the first convoy of troops. Among the first of the duties of the base surgeon, whose office was an integral part of that of the section commander, were the provision of infirmaries in and about the city, the establishment of a base hospital (French Hospital No. 59), the assignment of medical personnel, including those detailed to inspect incoming transports, and the establishment of a warehouse for medical supplies. This warehouse was to be a supply depot whence stores would be forwarded to the medical supply depot at Cosne or to the various base hospitals then arriving. Little could be accomplished in the development of the services of base section No. 1 until after the receipt of additional personnel and supplies, but on August 4 several organizations arrived, including Base Hospital No. 8, which was located at Savenay, about 20 miles from St. Nazaire. During the latter part of August, Base Hospital No. 27 was established at Angers, somewhat farther inland. By the end of August there were on duty with headquarters of the section 2 medical officers and 9 enlisted men, 7 of whom were handling supplies.

The prevention of venereal diseases was one of the earliest medical problems attacked, but its solution was made difficult by the lack of cooperation between American and French officials, the methods of their respective services being widely dissimilar. Numerous prophylaxis stations were established in the city, instructions concerning their usage were sent to all troops in the section, a base urologist was assigned, and the many venereal cases arriving on transports were isolated and treated. Detailed instructions concerning venereal control were later issued as provided in General Orders, No. 77, headquarters, A. E. F., 1917.

Early in September, 1917, the surgeon was instructed to establish a motor ambulance assembly park, where all motor transport for the Medical Department would be assembled and thence delivered to the proper organizations. An officer of the Sanitary Corps and 35 enlisted men were assigned to duty with this formation.

^b The statements of fact appearing herein are based on "Report of Medical Department activities, base section No. 1" (undated), made by Col. Charles L. Foster, M. C. On file, Historical Division, S. G. O.

By the 1st of October resources and responsibilities had so increased that the section surgeon's office was divided into three departments, viz, central office charged with administration, correspondence, records, and similar duties; motor transport branch, concerned with the receipt, assembly, and delivery of motor vehicles; medical property branch, concerned with receipt, storage, and shipment of general medical supplies.

The office of the surgeon of base section No. 1 remained an integral part of the headquarters of that section until January 28, 1918, when in anticipation of the reorganization of the entire American Expeditionary Forces it became a separate office of record in which the following departments were established: (1) General correspondence, including selection of hospital sites, establishment of hospitals and infirmaries, and issuance of instructions; (2) personnel branch, including reports on personnel; (3) sick and wounded branch; (4) property branch. Subsequently other departments were added, so that, as finally organized, the surgeon's office comprised the following departments: (1) personnel and motor transportation; (2) files, records, and general office branch; (3) evacuation of sick and wounded; (4) property and accounts; (5) hospitalization; (6) sanitation; (7) epidemiology; (8) base laboratory; (9) food and nutrition; (10) urology, including venereal diseases; (11) dental service; (12) professional consultants; (13) medical boarding service (of transports); (14) attending surgeon's office; (15) attending dental surgeon's office; (16) embarkation branch (concerned with troops returning to America).

The personnel and motor transportation branch acted on all reports concerning commissioned and enlisted personnel, made assignments to duty, kept personnel records and rendered reports concerning them to the chief surgeon, A. E. F. It also kept a record of the number and location in the section of all motor vehicles assigned to the Medical Department, requisitioned and assigned such vehicles and rendered such reports on motor vehicles as were called for. This branch was established on January 28, 1918, and did its maximum work during the latter half of that year, when the medical personnel numbered 500 officers and 4,500 men.

The files, records, and general office branch dated from the reorganization of the American Expeditionary Forces into sections on January 28, 1918. It handled all mail, conducted correspondence, issued circulars and similar documents, maintained a decimal filing system, mailing lists, and the custody of the office property. Pertaining to this branch were the commanding officer of the medical detachment on duty in St. Nazaire and a separate mess conducted for the men on duty in the office at the base laboratory, and at the supply depot.

The evacuation branch was charged with the movement of patients from hospitals to ships and with duties incident thereto. Before August, 1918, the number of patients evacuated to the United States through the port of St. Nazaire was not large, and included chiefly personnel recommended for discharge because of physical disability. During August and September, 1918, wounded began to arrive in this section, and during September 3,190 of them were evacuated to the United States.

An evacuation motor ambulance battalion was unofficially organized in November, 1918. A little later Motor Ambulance Company No. 44 and Evac-

uation Ambulance Company No. 9 were organized as a battalion to transport sick and wounded in the course of evacuation; later, Evacuation Ambulance Company No. 22 was added to this organization.

The first evacuation of any importance was made on September 20, 1918. From this time on the number of evacuations increased steadily, and by the latter part of March, 1919, this organization had transported 33,500 sick and wounded. The number of ambulances was increased to 38 Fords and 24 G. M. C.'s. Later 10 White reconnaissance cars were added for long hauls, the total vehicles now numbering 72.

These cars evacuated sick from all the base hospitals in the vicinity of the port as far as Quiberon, Carnac, Muecon, Vannes, Coetquidan, Plouharnel, Savenay, Nantes, La Croissic, and La Baule. The largest number transported to one boat in one day was 1,476 on December 27, 1918. The record for rapid evacuation was made on December 18, when 520 walking patients were unloaded from trains and transported to the wharves in 28 minutes. The longest evacuation, 78 miles, was made from Plouharnel. Patients evacuated through St. Nazaire came from the hospital centers at Nantes, Savenay, and from the hospitals at St. Nazaire. They were collected at Savenay for final examination, assembly of records, and provision of equipment, clothing, and kits, including toilet articles.

The property and accounts branch performed the duties indicated by its name. When the first stores arrived in June, 1917, a part of warehouse F was assigned to the Medical Department. Here stores were sorted and repairs made, but the bulk of the stores were loaded on cars at once and shipped to the supply depots in the interior. Later, warehouses E and G were assigned to the Medical Department and used in the same manner.

It was apparent almost from the first that a medical supply depot was necessary at the port for local issues. As an expedient, a small supply of extra stores was kept at Base Hospital No. 101, St. Nazaire, for emergency issues. On March 26, 1918, the section surgeon requested permission to keep on hand the most necessary stores for issue to nearby units. This request was granted and by July 1, 1918, a depot, though imperfect, was in operation. By September 1, warehouse E had been obtained, rebuilt, and stocked as a supply depot, and was issuing general stores to base section No. 1 and to base section No. 5 (Brest).

The hospitalization branch of the section surgeon's office was established in October, 1918, to have direct charge of hospital sites, buildings, administration, inspections, records, supplies, and similar duties incident to the service of such formations as were not under the direct control of the chief surgeon's office, A. E. F.

The sanitary branch of the section surgeon's office was organized on January 28, 1918. At first, this branch was concerned with reports and classifications of infectious diseases; isolation and treatment of cases of infectious disease arriving on transports; correction of sick and wounded reports; weekly sanitary reports; reports on evacuations; and reports on venereal diseases. Upon the organization of separate departments for venereal diseases, epidemiology, hospitalization, and evacuation, this branch controlled only purely sanitary affairs.

In August, 1918, base section No. 1 was divided into 12 sanitary districts to each of which a sanitary inspector and a health officer were assigned. These officers kept themselves informed concerning epidemic diseases in their respective districts, and reported them as occasion required.

An isolation camp with a capacity of 3,000 was established near Camp Hospital No. 11, but when preparations were made for the return of troops to the United States its capacity was increased to 4,000 and it was made a part of the embarkation camp, except that barracks for 1,500 men and for a proportional number of officers were reserved for isolation purposes. This group of barracks was located in one corner of the camp, inclosed by barbed wire, and so arranged as to permit its operation as a separate unit.

The epidemiological branch of the section surgeon's office was not made a separate element until November, 1918. Its duties were: (1) To receive and tabulate reports of epidemic diseases; (2) to direct measures for stamping out epidemics; (3) to maintain charts and graphs of prevailing communicable diseases; (4) to prepare the required reports for the chief surgeon.

From November 17, 1918, the epidemiological division issued a weekly report of infectious diseases, showing the number of different diseases developing in each camp, the weekly rate per 100,000 for each disease, and the strength of each camp or locality.

The base laboratory was opened at St. Nazaire on December 22, 1917, in two rooms. The purposes of the laboratory were those of a base laboratory for the section, viz, to distribute media and other laboratory articles to the various hospitals, to do routine analyses for permanent troops of the port, and to make Wassermann reactions for the whole base section. By July, 1918, the laboratory had enlarged its quarters, to a sufficient size and was prepared to do all required work, several additions having also been made to the personnel. During the summer of 1918, the unit received an 8-chest United States Army transportable laboratory, which was used in emergencies at Camp Hospitals Nos. 11 and 15.

One of the important duties of the base laboratory was to make water analyses, for water supplies throughout the section generally proved unfit for drinking purposes until purified. At first, St. Nazaire had a very small and poor water supply, of about 660,000 gallons per day. This supply was increased to 2,000,000 gallons per day by taking water from the Trignac Canal. Intensive sedimentation and chlorination of the canal were necessary, but even with these measures this water could not be made satisfactory, and a new system was later installed by the Engineer Corps, taking water from the River Brivet. This latter plant furnished 3,000,000 gallons per day, the water being coagulated, filtered, and chlorinated. Another plant for the Montoir camps provided 1,000,000 gallons per day. These plants were not completed until February 1, 1919. A separate plant for Savenay which furnished 720,000 gallons daily was in use by August, 1918. Other camps and billeting areas were supplied in various ways. The laboratory checked and supervised all these water plants and their output and published its findings.

The food and nutrition branch of the section surgeon's office was concerned with improving troop messes and conserving food. It was organized on April 16, 1918.

The branch of the section surgeon's office, concerned with urology and venereal diseases was organized on August 20, 1917. The general measures instituted by it were: (1) Formulation of instructions to be given the men by their officers; (2) the establishment of adequate prophylaxis stations; (3) recommendations concerning passes; (4) inspection of restricted districts; (5) supervision of the enforcement of general orders, A. E. F., relating to venereal diseases.

It was the policy to maintain a station in each permanent organization, and others at central points in the city, all being open day and night. For service of stations in the various parts of the section, the sanitary inspectors were responsible. The success of these stations may be inferred from the fact that during the last six months of 1918, only 1 case of venereal disease developed to each 312 prophylactic treatments given.

The office of the supervising dental surgeon was established at St. Nazaire on April 1, 1918. The supervising dental surgeon's duties at that time included the supervision of the dental work in base sections Nos. 1, 2, 5, and 7. Since organizations going through the section remained but a short time, the scope of the work was limited, for each organization had its own dental surgeon and but few were assigned to the base section.

On November 2, 1918, dental infirmaries were established at camp No. 1 and at Montoir. On December 17, the scope of the service was enlarged to meet the increased demands incident to the return of the troops to the United States; infirmaries were opened at camps Nos. 4 and 5 and additional ones at both Montoir and camp No. 1; more dental officers were assigned to the dental supervisor and one was placed in charge of each district.

The attending dental surgeon's office was established April 17, 1918, at section headquarters building in St. Nazaire, where 1,900 patients were treated and 3,000 operations performed.

A system of reports was established so that the work done each day by each dental office was tabulated and made of record. At the reception camp, dental officers were on duty making inspections of all men arriving for embarkation. Patients were listed according to the urgency of their needs for dental treatment and were ordered to the infirmary accordingly.

Consultants for the base section were appointed in general surgery, orthopedic surgery, and general medicine. These officers visited the various hospitals from time to time, made special reports on personnel and equipment and endeavored to remedy deficiencies. They were directed when necessary, to remain at a hospital long enough to give special instruction and training to the personnel, so as to insure the latest methods of treatment and uniform procedure throughout the section. When better facilities for special cases were known to exist at a particular hospital, recommendations were made for the transfer thereto of selected cases, especially the wounded. The orthopedic consultant also visited trains and transports to insure that the wounded were comfortable and that the apparatus in each case was properly adjusted.

The American and French health authorities agreed that our Medical Department should execute the French quarantine regulations of the port, in so far as these regulations applied to American transports. Consequently, a quarantine office was established about December 1, 1917, and the officer in charge was designated the medical boarding officer. His duties were defined as follows: (1) Transmission of the instructions to transport surgeons; (2) report of patients to be put ashore; (3) report of infectious diseases; (4) furnishing correct list of Medical Department personnel; (5) report of venereal inspection of troops and crews; (6) venereal inspection on ships which were without a transport surgeon. Later, the following duties were added: (7) Report of typhoid and paratyphoid fever vaccinations; (8) report to French authorities; (9) report on requirement that sera and vaccines be available on all vessels clearing the port with the Government passengers; (10) distribution of orders, letters, memoranda, etc., to transport surgeons. A bill of health was issued to each vessel sailing.

The medical boarding officer also supervised the sanitary condition of the wharves and transports at St. Nazaire and was a member of the board of inspectors which reported on the accommodations for troops all returning ships. Approximately 198,000 troops entered France through this port.

Following the signing of the armistice the section surgeon recommended that all incoming troops destined for the United States be placed in a receiving camp, where a thorough physical examination could be made, and where all officers and men having infectious disease, including skin or venereal diseases, could be separated and placed under treatment; that the remainder should be then disinfested, equipped with a complete change of clothing, and placed in the clean or embarkation camp proper.

The inspection and clearance of troops was placed under a special officer; the embarkation surgeon and all disinfesting operations were under the Quartermaster Department. Embarkation Memorandum No. 1, laying down regulations for the inspection of troops and the loading of transports, particularly stressed the subject of infectious diseases.

Troop trains were met by a medical officer, ambulances, and guides. Inspection was made, acute surgical cases were sent to Base Hospital No. 101, and medical, contagious, and venereal cases to Camp Hospital No. 11. Contacts were placed in the isolation camp, and were detained there as long as necessary.

At the gate of the embarkation camp, men stripped to the waist, dropped their breeches and passed in line before the medical examiners. One officer made examinations above the umbilicus and another below. Venereal cases (or suspects) were sent to a special examiner. Those unfit to travel were removed and diagnosis tags affixed to them. Vermin infested men were marked with argyrol. In this manner 12,000 or more could be examined in one day, 20 medical teams working at the same time.

After this examination the men who had passed secured their packs and went on to the clean camp, which could be entered only by way of the bathing and disinfesting plant. All took shower baths; the hair of those marked as vermin infested was clipped and crude oil was applied to the head, to remain

15 minutes. All then passed to a warm drying room where new underwear and socks were issued, then to the clean side where they received their packs, which had been heated for 20 minutes to 160°. From the clean camp the men went directly to the ships; but another examination was required if 24 hours had elapsed since the previous one. A clearance certificate was prepared for each organization or separate individual passed.

The hospital centers at Savenay and Nantes and Base Hospital No. 101, at St. Nazaire, had authority to evacuate patients directly to the transports, after their clothing, equipment, pay, and records had been inspected by the base inspector and personnel adjutant.

BASE SECTION NO. 5

In August, 1917, when the line of communications, A. E. F., was organized, base section No. 1, included the authorized facilities in the port of Brest.¹ It was not until December 14, 1917, that base section No. 5 was organized.² At that time it contained but one Department of France—Finistere. Eventually, base section No. 5 embraced parts of Brittany and Normandy (viz, the Departments of Finistere, Cotes du Nord, Ile et Vilaine, and Manche).³

Undesirable conditions which militated against the value of Brest for our debarkation purposes were the heavy rainfall, a soil which soon became a deep and tenacious mud, inability of large vessels to reach the piers, and the fact that the French Government hesitated to transfer to the United States debarkation facilities, in large degree, until after the armistice was signed, for Brest was the most important French naval base on the west coast.⁴ All disadvantages, however, were far outweighed by the situation, good harbor, and railway facilities of Brest. How indispensable this port proved is evidenced by the fact that approximately 791,000 of our officers and men here entered France and that an almost equal number left through it on the return voyage.⁴ Prior to November 11, 1918, Brest, and to a much less degree Cherbourg, were points of disembarkation in this base section and thereafter Brest was the principal port of reembarkation of the American Expeditionary Forces.⁴

A very limited personnel for the operation of the section arrived in Brest November 11, 1917, two days before the arrival there of the first convoy, consisting of 4 transports carrying 11,000 troops.³ Of these troops, 3 companies of the 301st Stevedore Regiment, with a detachment of 21 enlisted men of the Medical Department, were assigned as permanent troops in this section.³ The surgeon of this organization instituted the office of the section base surgeon on November 13.³

During the period when troops were arriving from America no large camps were established in this section, for no good sites existed in the immediate vicinity of the port nor could such as were available be made suitable without much time and labor; also the supply of building material was extremely limited.³ Because of this lack of camp facilities the troops of the first and many subsequent convoys were kept on board ship, where they could be sheltered and fed, until trains were available, and thence were sent toward the front or to other sections as quickly as possible after arrival.³ This procedure prevented isolation of cases of infectious diseases and contacts, and

permitted spread of such diseases along the line of communications, a circumstance that was attended by especially bad results, from a medical standpoint, during the epidemic of influenza.³ Brest at first also lacked many sanitary facilities and appliances for troops permanently assigned to this section. Buildings used as barracks and latrines by the troops first serving in the section were in poor condition and were very limited in number. The water supply was limited, and unsafe until chlorinated, but the limitation in its supply was overcome in part by collecting rain water. An adequate water supply, though early recommended, was not installed until July, 1918. Fuel was scarce, heating apparatus inadequate, and bathing facilities at first were lacking.³

For administrative purposes, base section No. 5 eventually was divided into the following units:³ Casemates Fautras Barracks; Fort Bouguen casual camp; Fort Bouguen prisoners-of-war inclosure; Camp Federes; Penfield prisoners-of-war inclosure; motor reception park; motor ambulance pool, Camp President Lincoln; Camp Gambetta; Camp de la Rampe; Camp Port Foye. The surgeon at each of these was in charge of sanitation and of a sanitary squad which each organized.

In addition to the section surgeon and section sanitary inspector, other officers eventually on duty in the office of the section surgeon were his assistant, an adjutant, a food and nutrition officer, and consultants in medicine, surgery, urology, orthopedics, neurosurgery, and dentistry.³

When American activities began in this section the hospitals operating in Brest were Navy Base Hospital No. 5, serving the personnel on American naval transports based on that port, and the French marine hospital performing the same duty for the French naval forces.³ Arrangements were made with the commanding officers of these hospitals for the care of such patients as might be among the arriving troops. At this time the first mentioned unit had a capacity of 40 beds, but was in process of moving to larger quarters where a capacity of some 400 beds was provided. All of these were not available for the Army, but as many as could be spared were freely allotted it. The number of beds made available at the French marine hospital was between 100 and 150.

During the month of December, 1917, Navy Base Hospital No. 1, with a capacity of 417 beds, expanded in times of stress to nearly 700, and staffed by Navy personnel was established in the Petit Lycee at Brest. This unit was loaned to the Army.³

On January 15, 1918, a formation first known as Pontanezen Barracks Hospital and later (February, 1918) designated as Camp Hospital No. 33, was opened in Pontanezen Barracks, its limited personnel being drawn from organizations passing through the port and from other sources.³ No nurses arrived until April. The bed capacity of this unit, at first 200, was increased in April, 1918, to 1,000 normal and 200 emergency. Later it was at one time increased to 2,600 beds, but never cared for more than 1,900 patients at one time. It occupied four barracks, 300 feet long, 13 Adrian barracks, and an old building formerly used by the French as an infirmary. In May, 1918, a hospital for contagious cases, under the jurisdiction of Camp Hospital No. 33, was built in its vicinity. This unit, Camp Hospital No. 33, was used for troops located permanently at or near Brest, but it also received patients from troops moving

to the front, and later those belonging to troops being returned to the States. During the period when influenza prevailed, August to December, 1918, the admissions numbered 12,465. This unit experienced many difficulties, of which the most serious were shortages in personnel, supplies, and equipment, and the fact that it was required to supply with medicines transient organizations temporarily in camp in this section. The base surgeon, in order to meet urgent needs, was obliged to divert supplies en route to medical supply depots farther inland. Sanitation of the hospital with the primitive facilities afforded was very difficult, and methods employed in different elements of it were, because of conditions encountered, somewhat diversified. Some latrines were pumped out by tank wagons, while others of the can type were emptied by contractors. Disinfectants were very scarce and it was impossible to render latrines fly proof. Eventually large cement latrines were constructed, which were to have been connected with the sewer system and flushed by waste water from the shower baths, but these were never installed, and the pits therefor were emptied by tank wagons or buckets.

Infectious cases were sent at first to the French marine hospital, but as more beds were provided in American formations the usage of that unit by Americans was gradually discontinued.³ Thereafter as far as possible infectious cases were sent to Camp Hospital No. 33 and noninfectious cases to Naval Hospital No. 1. It had been believed during the earlier period of activity in this base area that the units mentioned above would prove adequate, for at that time it was estimated that troop arrivals would average 20,000 per month.³ Later it was proposed to establish a hospital of 12,000 beds at Landerneau, about 30 kilometers east of Brest, and as a nucleus Camp Hospital No. 46, with a capacity of 260 beds, was established in June, 1918, in a convent at that place. This hospital was not increased in size—orders for the construction of a center there being canceled when the armistice was signed—and it was used chiefly as a hospital for convalescent wounded, except that in the fall of 1918 (October and November) it accommodated influenza-pneumonia patients from the transports.³

The most serious difficulties which the Medical Department encountered in this section were those incident to hospitalization and transportation.³

In order to care for patients brought ashore from transports and for others belonging to the troops permanently stationed here, hospital accommodations were rapidly expanded.³ They proved adequate even during the influenza epidemic when bed capacity rose to 6,200, though the Medical Department personnel then available was very limited.³

Hospitalization at Cherbourg for Army troops was provided by the British under an agreement whereby duplication of hospitalization facilities by the Allies was avoided.³ The British personnel charged with care of American patients there was assisted by 5 officers and 21 enlisted men of our Medical Department. A total of 179,911 troops landed at that port, which was closed December 27, 1918.

Though medical supplies for shipment elsewhere began to arrive at Brest in January, 1918, it was not until December 6, 1918, that authority for the establishment of an issue depot was obtained.³ On December 21, 1918, the

base supply depot was stocked and prepared to make issues to hospital trains, transports, dispensaries, troop organizations and, in emergencies, to base hospitals.

The laboratory unit assigned to serve this section was organized in Washington in February, 1918, as stationary laboratory No. 2, but after its arrival at Brest in the following May its designation was changed to base laboratory No. 5.³ It was gradually equipped to do the necessary work for this base section. Its greatest activities were the study and control of infectious diseases throughout the section, but it also exercised supervision over the smaller laboratories in and about Brest. Difficulty was experienced in securing supplies, but by August, 1918, all necessary equipment had been received. Thorough studies were made of all infectious diseases appearing in the section, from both bacteriological and pathological viewpoints.³ Also the laboratory prepared antitoxic sera and issued these and other supplies to hospitals in the section and to transports, and maintained close liaison with all units of the Medical Department, especially in respect to infectious diseases, and with the Engineer Corps in matters pertaining to water supply. Thorough examinations were made weekly of all water supplies, and all American troops were instructed to use no water for cleansing teeth, washing mess tins, or for drinking purposes unless drawn from a faucet marked "potable." Faucets were marked under supervision of the military officer commanding the area.

The only ambulances at first available were those furnished by the Navy, and despite its difficulties the ambulance service of Naval Base Hospital No. 1 was especially satisfactory.³ Later a few ambulances from the Army were received, but for several months after the port was opened the total number available was very limited. Ambulance Company No. 105 reached Brest on July 13, 1918, and was used to assemble ambulances and trucks at motor reception park No. 716.³ In August this company was also required to assist in the transport of sick and wounded. There were then but 9 ambulances available, 4 belonging to Naval Base Hospital No. 1 and 5 to Camp Hospital No. 33, but in September 5 more were assigned.³ Meanwhile trucks were used whenever possible. On October 12 Ambulance Company No. 105 was ordered to rejoin the 27th Division; and on the 19th Evacuation Ambulance Company No. 17, consisting of 1 officer and 31 enlisted men (later in the same month augmented by 37 others), was assigned to the pool, though it was not actually authorized in formal orders until November 12.³ On December 5, 1918, Evacuation Ambulance Companies Nos. 28, 37, and 38 were also assigned to this pool, with 3 officers and 110 enlisted men.³ The number of vehicles in and near Brest gradually increased so that eventually there were 70 ambulances at the motor ambulance pool, 16 ambulances at Camp Pontanezen, 5 ambulances at Camp Hospital No. 118, and 1 ambulance at Camp President Lincoln.³ The personnel consisted of 9 officers and 242 enlisted men.

Beginning with December, 1918, the pool took over the emergency ambulance service of Brest and vicinity, excepting Camp Pontanezen. Ambulances and men were always at call and requests were answered from points as far away as Quimper and Morlaix. In four months these calls numbered 1,243, and the number of patients carried was 2,920. This service, which operated under the

direction of the surgeon of the base section, unloaded all hospital trains either at the Kerhuon hospital center or at the Port du Commerce; transferred all patients from other hospitals to those at Kerhuon and from that center to the wharves and transports.

An officer of the food and nutrition section of the base surgeon's office reported September 14, 1918, and about a month later was joined by two noncommissioned officers especially qualified as instructors.³ Other officers and enlisted men joined, until on December 24, 1918, the force consisted of 7 officers and 6 sergeant instructors, which number was gradually reduced by needs elsewhere. This personnel, under general orders of this section, was directed to investigate conditions of messes, the preparation, conservation, and handling of food, instruction of mess sergeants and cooks. Improvements that could be made by local commanders were recommended directly to them, if they were able to effect them; otherwise to higher authority. Also messing conditions on transports and commercial vessels were inspected from time to time and appropriate recommendations made. The food service of transient troops, permanent troops, and hospitals presented many problems because of highly different conditions constantly being encountered, which were aggravated by shortage of material and labor and by unfavorable climatic conditions. Because of the policy to ship to the front, as far as possible, all men and materials and retain the barest necessities in building materials, as well as other assets, the base section for a long time lived under primitive conditions. Camps were so widely scattered throughout the vicinity of Brest and transportation was so limited that the ration period, except for bread, meat, and vegetables, was made to be one month, though storerooms were small and inconvenient.³ Water was scarce and its points of supply poorly distributed, necessitating several messes carrying by hand for long distances all water that they used.³ Mess service in hospitals was rendered difficult by the lack for a considerable period of a number of the usual ingredients of hospital diets and by the pressure of a number of patients greatly in excess of those for whom normal accommodations were available.³ Messes were operated by transients troops at the casual officers' camp, Camp Port Foye, Fort Bouguen, Casual Camp, and Camp Pontanezen.

The company kitchens at Camp Pontanezen were replaced at about the time the armistice was signed by others, each adequate to serve 5,000 men, some feeding as many as 9,800 men in 70 minutes.³ This method afforded certain advantages over that of company messes, but did not permit the preparation of so diversified or elaborate a menu. Because of the difficulty in getting permanent personnel to operate these kitchens, the primitive mess halls, the scarcity of fuel and water, and the inclement weather, mess service was at first difficult, but eventually satisfactory preparation and service of food were made possible.³

The dental service of this section was generally inadequate, the number of dental officers available being insufficient to meet the requirements of the troops stationed in the section and of those passing through.³ The situation was met as well as possible by shifting dental officers in accordance with the most emergent needs.³

During 16½ months, 2,105 deaths occurred at Brest, of which 59 per cent were among the troops who contracted their disease, or were injured, outside the base section.³ Sixty-seven per cent of the total occurred during the last week of September and the first three weeks of October, 1918, when influenza was epidemic. Of the latter percentage, 72 per cent occurred among patients who had contracted disease outside this section. A total of about 70,000 patients were cared for in the section.³

As the transports of the first convoy were obliged to anchor in the open road, and heavy rains were falling, pneumonia cases at or near the crisis were left on board, but other patients in that convoy were sent to Naval Base Hospital No. 5 or to the French marine hospital in Brest. Most cases of sickness among arriving troops was due to infectious disease, some cases of several different kinds being found on every transport. Thus the sick in the first convoy included men suffering from cerebrospinal meningitis, mumps, measles, and pneumonia. The same infectious diseases were found in all subsequent convoys, with also in some instances scarlet fever, diphtheria, and influenza. At first mumps and, to a less degree, measles were the most common infectious diseases, but on one transport an epidemic of scarlet fever developed.

The influenza epidemic began in a replacement draft from Camp Pike on August 12, 1918. These men were so closely quartered in a wooden barracks as to have but 129 cubic feet of air space each. By August 24, about 90 cases had developed, with 17 deaths. The draft was removed to a tent camp, where quarantine and other measures were enforced. Soon afterwards, influenza appeared in the civilian population of Brest. On September 8, an order was issued prohibiting troops entering places of public congregation. This local epidemic spread but little and subsided in a short time.

Cases of influenza began to arrive again early in September, but were few in number until September 12, when the *Kroonland* brought 117 cases of influenza and 6 of pneumonia.³ From this time on the number of cases rapidly increased until the middle of October, after which they rapidly declined. During September and October, 4,187 cases of influenza and 913 of pneumonia were disembarked.³ The transport surgeons on arrival often reported fewer cases of influenza and pneumonia than were detected after the troops landed, the number of influenza cases reported being about 50 per cent of those detected and the number of pneumonia cases about 95 per cent.³ Conditions on board naturally changed rapidly and records were made at the moment of anchorage, though sometimes the transports were not unloaded for from 24 to 48 hours, during which time cases developed in addition to those reported. Within five days after the different bodies of troops arrived at Brest on transports there developed among them 4,354 cases of influenza and 2,539 of pneumonia; i. e., 90 per cent of the pneumonia and 88.7 per cent of the influenza admissions for base section No. 5 developed among troops from transports. The number of deaths from pneumonia among these troops after landing was 1,217; 497 patients had died of that disease en route, making a total of 1,696 deaths among 218,000 troops transported.³

Sick were brought ashore by small launches, and as the larger transports anchored in the open road, where they were exposed to the rough sea, and as

there were frequent rains during the winter months, the transfer of patients to shore was slow and attended by much discomfort to them. Recumbent cases were transported in the Stokes litter, and after the armistice began on a special boat, for additional water transportation was then secured.³ Pneumonia patients, except when on foreign ships, were not removed unless they were in the first two or three days of their illness or had passed the crisis at least three days, and were in transportable condition. Eventually it was ordered that no pneumonia patients be transferred from ship to shore unless safely past the crisis.² Patients debarked at several piers, each of which offered some disadvantages, until finally Pier 5 was used, though here there was no shelter and patients had to be loaded direct from the tugs into ambulances, which at first were few in number.³

This port, in addition to St. Nazaire and Bordeaux, was used for evacuating sick and wounded to the United States from June, 1918.³ At first—that is, in May and June, 1918—patients arrived on hospital trains from the hospital center at Savenay, usually at night. Since they were evacuated usually the following day, all were fed and had their dressings changed. These requirements necessitated an increase in the bed capacity of the local hospitals, especially of Navy Base Hospital No. 1, the unit then principally used for this purpose because it was nearest the docks.³

Patients first began to arrive in appreciable numbers from hospitals farther forward early in July, 1918, in small but numerous detachments, which had been forwarded from Savenay.³ Soon a hospital car was added to the trains from that point, and others were added until they were replaced by a hospital train. As the sailing time and capacities of transports were uncertain a plan was developed and applied to hold patients in considerable numbers until they could be received on board the ships.³

With the exception of a few patients transferred direct from trains, patients were evacuated to the United States principally through the hospital center at Kerhuon, where shortages in equipment were made up, wounds dressed, payments made, records completed, and classifications effected according to naval requirements.³

As all transports coming to this port were under the direct supervision of the Navy, liaison relative to patients was established through a representative of the Medical Corps of the Navy and one of the Army, the latter being the evacuation officer.

Though evacuations were affected by an officer on duty in the office of the base surgeon, the medical boarding officer superintended the embarkation, and also received the sick from transports for transfer to hospital.

Patients were held at Kerhuon hospital center as short a time as possible, depending on the quality and quantity of bed space available for them on transports.³ Patients were classified as follows:

1. Bedridden: (a) Medical, (b) surgical.
2. Walking dressing: (a) Legless, (b) armless, (c) not needing assistance.
3. Tuberculous: (a) Bedridden, (b) requiring special attention, (c) requiring no special attention.
4. Mental: (a) Requiring restraint, (b) not requiring restraint.

Immediately before departure patients were inspected by an officer from headquarters, base section No. 5, who assured himself that all existing regulations had been complied with.³ Other hospitals in this base section evacuated through Kerhuon hospital center.³

Five hundred of the beds in the Kerhuon hospital center were set aside for the accommodation of nurses about to sail to the United States. This arrangement was made about February 14, 1919; prior to that time there had been no systematic arrangement for their lodging when awaiting return to the United States.³

The first hospital train from forward areas arrived in the base section October 26, 1918, and the great difference in the character of the cases received from this time forward required radical reorganization of the professional services.³ From this time the Kerhuon hospital center acted as one of the evacuation hospitals of the American Expeditionary Forces.³ The vast majority of patients arrived with very meager data. Several forward base hospitals evacuated all their patients at one time, including some who needed daily dressings, which were impracticable during the three or four days en route.³ This policy was soon corrected.³ Patients at Kerhuon constituted a group whose members were given final preparation for their voyage to the United States and could be held to meet, on short notice, calls from the Naval Transport Service to fill such space as might be available for the several classes of patients to be placed aboard.

After October 1, 1918, the carrying capacity of transports was increased and the disposal of patients simplified. Thereafter hospital trains were loaded in sections, each section being meant for a transport and having its passenger list, which was made up in triplicate. One copy was used to check patients on board, the other two filed in the base surgeons' office.³

Until November 15, 1918, 98 per cent of the casualties evacuated through Brest came from Savenay, where passenger lists were made up, a copy of which was given the transport service.³ From this the regular passenger list required for each transport was made up and patients according to the quota of each class on each transport were placed on board. A letter from the commanding officer of the transport service to the base surgeon, prescribed the quota for each transport and gave the following data concerning classification both of accommodations and of those who would utilize them.³ Number of beds, including those in the sick bay, for the bedridden; number of beds for those who could walk and could occupy troop standees, though requiring surgical dressings; number of nervous and mental cases, that could be carried; number of tuberculosis cases that could be carried in isolation or on open decks; beds available for those able to walk, requiring no attention, in rooms for officers; beds for convalescents requiring no attention.

A Red Cross rest station was erected on Pier 5 in the autumn of 1918, and later in the same year a larger and more modern building on Pier 6 was used by that association for the same purpose. From their station the society issued refreshments to patients awaiting transfer to the tugs that would take them to their vessels.³

A replenishment depot for hospital trains, with a personnel of 1 officer and 4 enlisted men, was established about December, 1918, in order to replenish with medical and quartermaster supplies such of those units as entered the base section.

The following tabulation shows the number of patients evacuated from Brest to the United States from May, 1918, to July, 1919:³

Evacuation of sick and injured to the United States, base section No. 5, from May, 1918, to July 31, 1919, inclusive

	Medical	Surgical	All others	Total
1918				
May.....				20
June.....				152
July.....				425
August.....				324
September.....				2,784
October.....				3,220
November.....				5,807
December.....	2,646	4,922	831	8,399
1919				
January.....	1,824	1,656	350	3,830
February.....	5,190	2,215	250	7,655
March.....	4,546	2,804		7,350
April.....	5,468	3,510		8,978
May.....	5,338	2,925		8,263
June.....	5,120	2,644		7,764
July.....	3,318	301		3,619
Total.....	32,450	21,977	1,431	68,390

CAMP PONTANEZEN

From January to December, 1918, Camp Pontanezen functioned as a debarkation and rest camp, with a small permanent garrison.⁵ From (and including) December, 1918, it operated as an embarkation camp.⁵ The permanent strength of this camp rose to about 15,000.⁵

In the spring of 1918 a board of officers examined Camp Pontanezen and found it fairly satisfactory for about 10,000 men, provided certain improvements were made.⁵ Some of the improvements recommended by the board were effected, but during the summer and fall of 1918 the small permanent garrison was straining every nerve to keep the tide of men and supplies moving toward the front, and had but little time or resources wherewith to accomplish much in the way of improvement.⁵

The camp consisted of an interior and an exterior area. The interior area, covering approximately 15 acres, was inclosed by a wall and contained six old and very large stone barracks and several other smaller buildings. This area, known as Pontanezen Barracks, had long been used by the French as a military garrison.⁵ The exterior area, comprising farm land surrounding the inclosure, was gradually extended by requisitioning land from the French as it was needed. It expanded from about 90 to approximately 1,000 acres when the camp reached its maximum capacity in the spring of 1919.⁵

The final dimensions of the camp were approximately 1 mile wide by 1½ miles long.⁵ It lay on a hillside, sloping toward the south, about a mile and a half from the harbor. Though the slope afforded drainage, there was neither good roads, walks, sewers, nor drainage ditches, and the clayey loam surface

was cut up into small rectangles by dykes and hedges. Consequently, conditions at first were very unsatisfactory, for not only was it necessary to utilize the camp before it was ready, but also the weather was cold and inclement and the soil such that it formed a deep and tenacious mud. The last mentioned fact greatly interfered with both construction and service. Other defects were insufficient kitchens, lack of mess halls, inadequate means of sterilizing mess kits, poor latrines, limited bathing and disinfecting facilities, limited means for washing hands, shortage of fuel, and an inadequate water supply, which was polluted. These unsatisfactory conditions were intensified by the relative lack of trained camp personnel and the great numbers of troops which arrived.⁵

At first there were only two roads, which ran north and south; however, two east and west roads soon were built, and a number of good thoroughfares had been completed by April, 1919.⁵ Also by that time footways, largely "duckboard," were provided.

In addition to Pontanezen Barracks, the only other shelter at first available consisted of several temporary barracks, which had been erected in November, 1918, and pyramidal tents for 5,000 men.⁵ Prior to this time, a number of the troops had to occupy shelter tents. In the latter part of December, 1918, only 44 per cent of the pyramidal tents were floored; however, by April, 1919, barracks and floored tents were adequate. At that time 450 barracks each accommodating 110 men, and 5,000 floored tents, each accommodating 6 men, were available.⁵

The activities of the camp surgeon's office were varied. Sections of it were charged, respectively, with administration, records, statistics, sanitation, and medical clearances.⁵ The camp hospital and segregation camp were ultimately placed under control of the camp surgeon, thus promoting their coordination.⁵ Weekly conferences of medical officers were held and health and venereal bulletins were issued to acquaint line and medical officers with prevailing local sanitary and health conditions. Although most organizations passing through the camp were accompanied by their medical detachments, some were not, and for these it was necessary to maintain six infirmaries, besides the seven maintained for permanent organizations.⁵

For purposes of sanitary control Camp Pontanezen was divided into 17 sections, each supervised by a sanitary inspector.⁵ Senior surgeons of organizations were held responsible for sanitation in their own areas, to each of which two men and a sufficient number of labor troops were assigned.⁵ Under the control of the camp sanitary inspector were 3 chief assistants, 2 sanitary squads, and 265 men from a labor battalion. Three men from the labor battalion were assigned to each kitchen, and six to every five latrines. Those on duty at the kitchens were required to keep the garbage cans and surroundings clean; those at the latrines washed the seats daily and sprayed the interiors twice daily with cresol and crude oil.⁵ The sanitary squads (which supervised the work of the labor troops) were in addition to two others which operated the disinfecting plants.⁵

Certain sanitary activities required special inspectors; for example, one officer was engaged solely in the inspection of troop kitchens, one had entire charge of drainage problems, another supervised construction of latrines.⁵ The

officers concerned with drainage and latrines worked with the Engineer Department.⁵

Every day the camp sanitary inspector held a meeting of his assistants, and each week the camp surgeon held a conference attended by all senior surgeons and sanitary inspectors.⁵

For a long time there was but one kitchen in Camp Pontanezen. This was operated in an old stone building within the walls of the caserne.⁵ It had 7 double field ranges and 41 French caldrons, but no mess hall. In December, 1918, a mess hall was built, but since it accommodated only 400 men, the great majority ate in the open, although there was almost incessant rain at this time.⁵ This kitchen fed about 7,000 men daily and operated day and night until April, 1919.⁵

In December, 1918, seven kitchen buildings were constructed and temporarily equipped with field equipment.⁵ These buildings were long and low, each being divided into five separate kitchens, equipped with two double field ranges and a number of caldrons for coffee, stews, etc. At the end of December, 1918, but three kitchens had mess halls.⁵ These had high, wooden tables, and dirt floors, which emitted a putrid odor from the trampling in and decomposition of food particles. Since these kitchens had to prepare food for from four to seven thousand men each, necessarily the menus were simple, consisting chiefly of bread, beans, coffee, and stew.⁵ Subsequently, these kitchens were properly equipped and were made permanent.⁵

Meanwhile, model kitchens were being constructed, one for each area into which the camp was divided.⁵ These were called "troop kitchens." Each was approximately 375 feet long and comprised six completely equipped unit kitchens, with all necessary modern appliances, and had a concrete floor, water supply, and sewer connections. Vegetable bins, made of wire netting and set above the floor, were installed, and a room for meat was built in each kitchen. The mess halls were about 300 feet long. Each could feed 5,000 men in 40 minutes. By a system of inspections and markings, a friendly competition was brought about among the personnel of all kitchens; personal cleanliness on the part of the kitchen force was a requirement especially stressed.⁵

The disposal of garbage was a constant problem.⁵ Early in 1918, part of the garbage was taken by French civilians, but for sanitary reasons this had to be discontinued. The garbage was then buried in great pits. After the troop kitchens, referred to above, had been constructed and a less simple ration became possible, the amount of garbage increased to such an extent as to fill from 60 to 80 large cans per day at each of the 16 kitchens. This was too large an amount to be constantly burying, so during March, April, and May, 1919, incinerators were constructed at the kitchens, each capable of disposing of all the garbage, then averaging more than 45 cans per kitchen daily. These cans were kept in a special concrete stand.

Feces were disposed of as follows:⁵ In the caserne a number of old French latrines of the hopper type, with cesspools, were utilized. In the outside area latrines were constructed, use being made of galvanized cans. In October, November, and December, 1918, about 25 cement-lined pit latrines, with urinals, were constructed and their contents removed by odorless excava-

tors. In January, February, and March, 1919, these were supplemented by a large number of pit latrines of the box type. The contents of the latrines of the can type and of the cement vault type were hauled away and buried in two deep pits, or trenches, at the edge of the camp. These pits were frequently burned out with crude oil and the contents covered with dirt. By April this system was abandoned.

From November, 1918, to July 1, 1919, there were practically no flies at Camp Pontanezen.⁵ One reason for this was that there were very few animals in camp, as motor trucks were used instead of horse-drawn vehicles, and the small amount of manure which required disposal was hauled away by French farmers, or buried in the pit latrines with feces.⁵

The sick at Camp Pontanezen were cared for usually at Camp Hospital No. 33.⁵ Navy Base Hospital No. 1, Camp Hospital No. 46 at Landernau and the Kerhuon hospital center were also available.⁵ During the influenza-pneumonia epidemic of October, 1918, and at times soon after the armistice was signed, the hospital facilities were taxed to their utmost capacity, but the sick and wounded were always provided for.⁵

A quarantine camp, including a venereal segregation camp, was established December 6, 1918, at the northern extremity of Camp Pontanezen in a triangular area, bounded by three public roads.⁵ The entire plant was termed "the quarantine camp" until February 13, 1919, when the designation "Segregation camp" was adopted. The men were quartered in floored tents, not more than six men to a tent.

The segregation camp was divided into plots, to each of which was assigned a certain class of cases.⁵ The quarantine section proper had a capacity of 300 beds and received the contacts of communicable diseases from among permanent troops at Brest and Camp Pontanezen and from transient troops en route to the United States. The venereal section, divided into subsections for white and colored, and with a total capacity of 700 beds, was used for all uncomplicated cases of venereal disease in a communicable stage. Complicated cases were sent to hospital. The staff of this section consisted of 10 officers and 244 enlisted men, the officers including 3 genitourinary specialists, 1 skin specialist, 1 dentist, and 1 laboratory officer. Negro venereal patients were separated from the white men in this class; venereal suspects were also separated from those with a definite diagnosis of such diseases. Patients with definitely established venereal diseases were classified as A, B, and C. The men in class A were those unable to do any duty. Those in class B performed light duty, and those in class C full duty (or labor).

A hospital with 200 beds and a laboratory was maintained for this camp. Patients with scabies were treated in an especially equipped building.

The capacity of the segregation camp was about 1,500 until June, 1919, when all venereal cases in the vicinity of Brest were transferred to it.⁵ Early in July, 1919, all the venereal cases from the Third Army were received, as well as others from various parts of France, necessitating extensive additions.⁵ All patients were organized into battalions, of which there were six in July, forming a provisional regiment. Extensive buildings for treatment were provided, with facilities for treating 4,000 cases of gonorrhea and 2,000 cases of chancroid

in one-half hour. At this time the camp was largely a venereal camp; the number of contacts being relatively small. The number of cases of venereal disease segregated in it numbered about 1,200; and all contacts about 200.

This camp had a canteen and a Y. M. C. A. hut (with capacity of 2,000). Educational classes were maintained, instruction was given in hygiene, citizenship, and other subjects, and a generally friendly attitude was maintained.⁵

PREPARATION FOR EMBARKATION

The principal function of Camp Pontanezen was to prepare troops for embarkation.⁵ The basic idea was a division of the entire camp into areas, each receiving an entire organization. Within its own area each unit had its kitchen, infirmary, prophylactic station, and welfare hut. From all these units a communal segregation camp received venereal cases and infectious disease contacts. Men, seriously sick, suspected of having an infectious disease, or with fever, were sent to Camp Hospital No. 33.⁵ Sterilizing and disinfesting plants were provided to eliminate vermin. The plan was not to pass men from area to area but to hold them in one, retaining from each command the contacts and patients with venereal disease.⁵

Organizations arrived from the interior at all hours of the day and night. Data concerning the strength of each arriving organization were telephoned to the billeting officer, and tents were assigned before troops reached their designated area. Preparations for embarkation of the organization were then begun conformably to the following method.⁵ On arriving at the camp the organization, as stated above, was assigned to a definite area, containing a kitchen, infirmary, water supply, latrines, sewer connections, etc. Commanding officers and medical officers reported at the main billeting office for instructions. Instructions for medical officers dealt with: (1) Reports required; (2) disposition of sick and contacts; (3) physical examinations required; (4) infirmaries, ambulances, and prophylactic stations; (5) medical supplies and dental treatment; (6) general orders and memoranda of medical interest.

Within 24 hours after arrival, the transient organizations received orders to report for physical examination at a specified time.⁵ These orders were so issued as to call for 240 men every 10 minutes. The unit reported at a large central building arranged for examination and bathing. This structure had numbered seats (benches) for 480 men. The men stripped to their undershirts and stood on benches, two rows facing each other. The medical inspector then passed between each two rows examining for venereal disease and vermin, thus making it unnecessary for the inspector to stoop. The men then stepped down from the benches and pulled their undershirts over their heads and the inspector passed along a second time examining for skin diseases, scabies, and body lice. Men found to be diseased or infested with vermin were at once segregated in a special room. The others placed their underwear and socks in bins for sterilization, leaving their outer clothing on the numbered seats. At a given signal, 120 men went to the shower-bath room, where they received a four-minute hot bath. Each man was then given a clean towel, clean socks, and underwear, whereupon all men returned to the numbered seats. Here they dressed quickly in their old clothing and then passed out of the building. But one minute was

allowed for a change of groups in the bathrooms, so that a continuous stream of bathers was kept going at the rate of 120 men every 5 minutes, orderlies being in charge to prevent talking and to maintain order. Lists of men cleared were sent daily to the medical clearance officer.⁵

Men found with lice or nits were sent with an officer of their organization to their quarters to procure their blankets and other clothing and then to a disinfesting plant.⁵ There they undressed completely and placed all their clothing in receptacles to be sterilized, themselves passing to a room where the axillary and pubic regions were closely clipped and treated with vinegar. They then went to a bathroom, where they rubbed the entire body with kerosene soap (1 pint of kerosene to 5 pounds of soap dissolved in hot water), following this with a hot shower. While this process was going on, all the men's clothing, except leather and rubber articles, was sterilized by steam for a period of 20 minutes. On leaving the bath, men were given clean underwear and clean socks and their own outer clothing was returned to them. The medical officer in charge then checked the list of men and receipted it by writing "deloused" with date and signature. This list was then forwarded to the medical clearance officer.

Though men with lice were sent to the disinfesting plant and treated as detailed above, those found with scabies or venereal disease were sent to the segregation camp for treatment.⁵

Before organizations could embark, they were required to have clearance certificates covering all officers and men.⁵ Whereas each officer was required to have a separate certificate, the clearance for an organization covered all its enlisted men. A medical clearance officer received all lists of clearance from the examining and bathing building, from the disinfesting plant, or from the segregation camp, as the case might be. The certificates of examination of an organization, certificates of examination of its officers, and lists of men found with vermin, scabies, or venereal disease were clipped together and marked "Uncleared." When the report of the disinfesting plant was received this was added, as was also the report of admission of cases of scabies and venereal disease to the segregation camp. When all lists were checked and balanced, all men found to have been examined, all those with lice had been disinfested, and all scabies and venereal cases sent to the segregation camp, the papers were signed by the chief epidemiologist, and the organization concerned was "cleared." Clearance certificates were then sent to the troops movement office and to the base surgeon, one was filed, and one was furnished to the organization when it received sailing orders. If the organization did not sail within six days, it had to be reexamined.⁵

One other, last certificate was required showing that each man's throat had been examined daily and his temperature taken within 24 hours of sailing.⁵ Any man having a temperature 1° above normal was sent to hospital; any with a suspiciously appearing throat was sent to the segregation camp.

If men in hospital became of duty status in time to sail with their organization, they were returned to it; if not until after the organization had sailed, they were transferred to a casual company, which embarked as a unit.⁵ Personnel to be embarked as "sick" or "injured" were transferred to the embar-

kation hospital at Kerhuon. Contacts in the segregation camp were treated as ordinary sick.⁵

The camp surgeon received the following three troops lists daily:⁵ (1) Billeting office, giving organization, strength, and location and date of arrival (changes of location were also reported); (2) personnel office, strength for statistical purposes; (3) camp headquarters, list of transient troops, preparing for inspection, ready for inspection, and ready for embarkation.

SURGEONS OF TERRITORIAL SECTIONS

BASE SECTION NO. 1, FRANCE

Col. George P. Peed, M. C., July 2, 1917, to July 17, 1917.
Col. Clyde S. Ford, M. C., July 18, 1917, to December 29, 1917.
Col. Charles L. Foster, M. C., December 30, 1917, to June 28, 1919.
Lieut. Col. Felix Hill, M. C., June 29, 1919, to July 15, 1919.

BASE SECTION NO. 2, FRANCE

Col. Larry B. McAfee, M. C., August 30, 1917, to February 22, 1918.
Col. Henry A. Shaw, M. C., February 23, 1918, to October 13, 1918.
Col. H. C. Coburn, jr., M. C., October 14, 1918, to October 28, 1918.
Maj. Gen. Robert E. Noble, M. C., October 29, 1918, to April 20, 1919.
Col. C. R. Reynolds, M. C., April 21, 1919, to July 13, 1919.

BASE SECTION NO. 3, ENGLAND

Col. W. J. L. Lyster, M. C., July 7, 1917, to January 13, 1918.
Lieut. Col. Robert M. Skelton, M. C., January 14, 1918, to January 24, 1918.
Col. Charles F. Mason, M. C., January 25, 1918, to April 15, 1918.
Col. Thomas U. Raymond, M. C., April 16, 1918, to May 16, 1918.
Brig. Gen. F. A. Winter, M. C., May 17, 1918, to October 17, 1918.
Col. F. A. Washburn, M. C., October 18, 1918, to March 10, 1919.
Col. A. M. Whaley, M. C., March 11, 1919, to June 15, 1919.

BASE SECTION NO. 4, FRANCE

Lieut. Col. Edward L. Napier, M. C., January 1, 1918, to July 12, 1918.
Lieut. Col. Ralph H. Goldthwaite, M. C., July 13, 1918, to May 10, 1919.

BASE SECTION NO. 5, FRANCE

Lieut. Col. William Denton, M. C., November 12, 1917, to May 11, 1918.
Col. Guy L. Edie, M. C., May 12, 1918, to May 10, 1919.
Maj. Gen. R. E. Noble, M. C., May 11, 1919, to July 15, 1919.

BASE SECTION NO. 6, FRANCE

Maj. Holland M. Tigert, M. C., June 2, 1918, to July 14, 1918.
Col. W. E. Vose, M. C., July 15, 1918, to January 15, 1919.
Col. C. E. Morrow, M. C. January 16, 1919, to April 9, 1919.
Col. Paul S. Halloran, M. C., April, 10, 1919, to June 18, 1919.

BASE SECTION NO. 7, FRANCE

Lieut. Col. C. C. Demmer, M. C., July 1, 1918, to July 15, 1918.
Col. Herbert G. Shaw, M. C., July 16, 1918, to April 25, 1919.

BASE SECTION NO. 8, ITALY

Col. Elbert E. Persons, M. C., October 17, 1918, to April 7, 1919.

BASE SECTION NO. 9, BELGIUM

Col. Jacob M. Coffin, M. C., May 13, 1919, to July 15, 1919.

DISTRICT OF PARIS

Col. E. G. Bingham, M. C., May 5, 1918, to September 21, 1918.
Col. Larry B. McAfee, M. C., September 22, 1918, to July 15, 1919.

REFERENCES

- (1) G. O. No. 20, H. A. E. F., August 13, 1917.
- (2) G. O. No. 75, H. A. E. F., December 14, 1917.
- (3) Report of Medical Department activities, base section No. 5, undated, compiled under the direction of the base surgeon from official records in his office. On file, Historical Division S. G. O.
- (4) Ayres, Leonard P., Colonel, General Staff: The war with Germany. Washington, Government Printing Office, 1919.
- (5) Report of Medical Department activities, Camp Pontanezen, Brest, compiled under the direction of the camp surgeon. On file, Historical Division S. G. O.

SECTION III

HOSPITALS

CHAPTER XXI

HOSPITAL CENTERS

How the hospital center came to be adopted by the Medical Department, A. E. F., is set forth in Chapter XV, Section I. This need not be gone into further here. Following soon upon the conception, the chief surgeon, A. E. F., recommended in September, 1917, after the layout and buildings for individual type A (base) hospitals had been approved, that five such units be erected, to form a hospital center at Bazoilles-sur-Meuse.¹ This project was promptly approved by the general staff, A. E. F. As the situation developed, larger and larger centers were provided, the erection of new units and the utilization of existing buildings for this purpose progressing rapidly.¹ On December 12, 1917, authority was given for the construction of 10 type A hospitals at Allerey, Beaune, Mars, and Mesves.² The next day a project for 3,000 beds at Nantes was approved. By the end of December other centers had been authorized in the following places:² Beau Desert (Bordeaux), 5,000 beds, to be expanded to 20,000; Langres, 2,000 beds; Rimaucourt, 2,000 beds, to be expanded to 9,000; Limoges, number of beds to be determined; Perigueux, number of beds to be determined.

Other centers were gradually added at Vittel-Contrexeville, Savenay, Vichy, Toul, Kerhuon, and on the Riviera, so that eventually 20 hospital centers were operating before the armistice began, of which 5 were located in the advance section, 8 in the intermediate section, and 7 in the base sections.¹ A number of others were being constructed and additional ones were projected when the armistice was signed.¹

SELECTION OF SITES AND CONSTRUCTION

Sites were selected by one or another member of the hospitalization division of the chief surgeon's office, A. E. F. In some cases the sites had been suggested by French authorities.¹ Proposed sites were finally accepted or rejected by a joint board, of American and French officers, on which were American representatives of the general staff (G-4), the chief surgeon's office, the Engineer Department, and a railway transportation expert.¹ The sites were leased by an officer of the Quartermaster Department assigned to duty with the chief surgeon for that purpose, but construction was in charge of the Engineer Department.¹

Approval of a site was determined largely by conformity with the proportion of beds authorized in the advance, intermediate, or base sections; and by availability of railway facilities.³ This latter requirement took cognizance of all matters affecting railway service, that is, distance from the front, proximity to main railway lines, grade and condition of trackage, strength of bridges

(whether sufficient to support American hospital trains), available rolling stock, existence or practicability of sidings, and similar considerations.³ Since the French controlled the railways, their advice and cooperation were essential in locating these centers.³

Buildings utilized by centers were of two general types—preexisting French buildings and newly constructed barracks.³ The former consisted of groups of hotels or military barracks where from two to seven hospitals were operated, and whose capacity varied from 1,000 to 16,000 beds.³ Prominent centers of this type were those at Toul, Vittel-Contrexeville, Vichy, and on the Riviera, the first mentioned utilizing barracks and the last three, hotels.³ Often these buildings, especially the hotels, were poorly adapted to hospital purposes for they required extensive alterations, additions—especially of plumbing—and repairs. Also many of the hotels had no heating arrangements having been constructed for occupancy during summer only.³ Rents of such structures also were excessive.⁵ On the other hand, the military barracks utilized were obtained from the French practically without cost.¹ These, generally speaking, were more desirable for hospital purposes than hotels for they were large, built of stone or cement, and arranged in convenient groups.¹ Each barrack accommodated about 1,500 patients in rooms larger than those in hotels, thus assuring easier service to a given number of patients.¹ Their disadvantages were lack of water-carriage sewer systems, inadequate water supply, and absence of suitable artificial light.¹ When the armistice was signed six centers were operating in French buildings with a normal capacity of 38,340 patients and an emergency capacity of 51,523.³

Centers occupying barracks constructed for the purpose, consisted of a number of type A hospital units (whose layout is given in Chapter XV), together with some accessory, communal buildings.³

It was planned eventually that the constructed centers would consist of from 2 to 20 complete type A base hospitals of 1,000 beds each, with facilities for expansion to from 50 to 100 per cent additional.³ Each center was also to include a convalescent camp whose capacity would be 20 per cent of the "normal" beds in the center.³

The geometrical layout of the individual units was admirably suitable for this arrangement, as exemplified by the ground plan of the center at Mars.³ When a site was selected capable of accommodating a number of type A units the Engineer Department made an initial survey which had particular reference to contour lines, and units were disposed in a manner most adaptable to them, thus saving considerable piling and excavation.

Representatives of the chief surgeon's office, A. E. F., and of the Engineer Department, in charge of construction projects, worked out together the layout for each center. Some of the more important items which they considered in this matter were the location and adequacy of railway sidings, frontage of units thereon, provision of such common buildings as offices, storehouse, garage, bakery, and ice plant, post office, telegraph and telephone exchange, fire engine house, chapel, laboratory, and morgue, for the service of the entire center, the construction of roads and installation of drainage, water, sewerage and lighting systems.¹ The larger centers, some of which had a projected

capacity of 20,000 beds, approximated veritable cities with all their accessory public-utility requirements.¹

When the armistice was signed, 14 centers were operating in newly constructed barracks, with a normal capacity of 69,059 and an emergency capacity of 127,270 beds.³ Very few of these barracks hospitals, however, were fully completed and it was necessary to occupy them while yet under construction.¹ The personnel of the Medical Department locally on duty and convalescent patients assisted materially in the completion of these projects. In many respects service in them was easier than in centers which occupied buildings several stories in height.¹

Special hospitals were features of all centers. In each, certain units were specially equipped for the treatment of surgical, orthopedic, eye, ear, nose, and throat, maxillofacial, psychiatric, neuropsychiatric and, in some centers, contagious cases.³ The center at Savenay had a special hospital for the treatment of tuberculosis patients and that at Vichy had special facilities for maxillofacial cases.³

The following table shows not only the hospital capacity (normal and crisis) but also the number of beds occupied, grouped by section, on November 28, 1918:⁴

Name	Normal capacity	Crisis	Occupied
Advance section:			
Toul center.....	15,250	15,250	10,963
Bazoilles.....	7,000	13,136	2,094
Vittel-Contrexeville.....	5,951	9,875	3,545
Rimaucourt.....	5,000	10,388	2,519
Langres.....	2,000	3,000	571
	35,201	51,649	19,692
Intermediate section:			
Beaune.....	4,000	10,200	4,934
Allerey.....	10,000	14,468	10,728
Mars.....	11,468	20,000	8,098
Mesves.....	10,490	21,500	16,346
Vichy.....	8,327	13,000	10,250
Clermont-Ferrand.....	6,712	6,712	3,017
Orleans.....	2,800	2,800	1,135
Tours.....	2,300	2,850	1,870
	56,097	91,530	56,378
Base section No. 1:			
Angers.....	3,500	4,400	2,913
Nantes.....	4,300	6,278	4,383
Savenay (St. Nazaire).....	8,000	8,316	8,500
	15,800	18,994	15,796
Base section No. 2:			
Beau Desert.....	6,924	11,000	5,439
Limoges.....	4,528	6,000	5,485
Perigueux.....	1,000	1,500	983
	12,452	18,500	11,907
Base section No. 5: Kerhuon (Brest).....	2,800	2,800	2,438

At this time these centers contained about two-thirds of all the hospital beds (other than those in field units) in the American Expeditionary Forces.¹ It had been planned that should the war continue until April, 1919, the centers would contain no less than half a million beds.¹ Hospital construction with this end in view was well advanced, but inadequate personnel and equipment were delaying progress. No centers were constructed in England or Italy.¹

The center which attained the largest size was that at Mesves, which, from November 11 to December 5, 1918, reported daily a capacity of 25,000 beds.³ On November 16 this center had a total of 20,186 patients and the total strength of the command, including those on duty, was 28,828.³

On November 14, 1918, patients in hospital centers numbered 109,238, with 22,191 men in their convalescent camps—a total of 131,429.⁵ The total number of patients in all base and camp hospitals and of men in convalescent camps numbered on that date 190,356. In other words, 69, per cent of men then under treatment in fixed formations were occupants of these centers. The total number of normal and emergency beds (including 29,284 in convalescent camps) then provided numbered 292,049. Of this number 182,045, slightly less than 70 per cent, were in hospital centers.⁵

The following hospital centers were in existence December 1, 1918:⁶

Name of center	Hospitals comprising	Type of building	Normal bed capacity
Allerey	25, 26, 49, 56, 70, 97, and E. H. 19	Barrack construction	10,000
Bazoilles	18, 42, 46, 60, 79, 81, 116	do	7,000
Beau Desert	22, 104, 106, 111, 114, 121, Prov. B. H. No. 7	do	6,924
Beaune	47, 61, 77, 80, 96	do	5,500
Clermont Ferrand	20, 30, 103; includes Chatel Guyon and Royat	French buildings	5,137
Commercy-Lerouville	90, 91	do	(a)
Kerhuon	63, 92, 105, 112, 120	Barrack construction	2,700
Langres	53, 88	do	2,000
Limoges	13, 24, 28	do	4,528
Mars	14, 35, 48, 62, 68, 107, 110, 123, 131	do	11,468
Mesves	50, 54, 67, 72, 86, 89, 108, 122, and E. H. No. 24	do	10,490
Nantes	11, 34, 38, 216	do	4,300
Pau	71; includes Dax, Lourdes, Argeles Gazost, Bagneres de Bigorre	French buildings	(b)
Perigueux	84, 95	Barrack construction	1,000
Rimaucourt	52, 58, 59, 64	do	5,000
Riviera	99; includes St. Raphael, Cannes, Nice, Menton	French buildings	
Savenay	8, 69, 100, 113, 119, 214, 118, and E. H. No. 29	Barrack construction	8,000
Toul	45, 51, 55, 78, 82, 87, 210	French buildings	15,250
Tours	7 and Prov. B. H. No. 1	Barrack construction	(c)
Vannes	136-236, Quiberon	French buildings	1,400
Vichy	1, 19, 76, 109, 115	do	8,327
Vittel	23, 31, 32, 36	do	5,951

a Evacuation Hospital No. 13 was operating here until November 30, when it was relieved by Base Hospital No. 91. Base Hospital No. 90 never received patients.

b Staffed, but never received patients.

c Did not receive patients until after the armistice began.

The increase in bed capacity of all the centers is shown by the following table:¹

	Normal	Emergency		Normal	Emergency
1918			1918		
July 1	30,890	33,498	Oct. 1	109,897	160,286
Aug. 1	70,124	86,252	Nov. 1	143,869	221,421
Sept. 1	78,371	102,144	Dec. 1	163,368	282,182

As an index of the extent of activities of the different centers, the following table is given. It shows the total number of patients passing through the principal hospital centers to March 31, 1919:³

	Patients		Patients
Toul (nearest front).....	67, 866	Nantes.....	29, 538
Bazoilles.....	66, 284	Kerhuon.....	24, 533
Savenay.....	61, 973	Limoges.....	23, 818
Beau Desert.....	47, 238	Rimaucourt.....	21, 067
Vichy.....	46, 297	Joue-les-Tours.....	13, 701
Vittel-Contrexeville.....	44, 855	Riviera.....	13, 446
Mesves.....	38, 765	Beaune.....	13, 500
Allerey.....	33, 658	Perigueux.....	4, 540
Mars.....	33, 256		

CONTROL

Hospital centers were under the direct control of the commanding general of the Services of Supply, except in matters of discipline, guard, fire control, supplies, and inspection.¹ For all these excepted matters each center was under control of the commanding general of that section of the Services of Supply in which it was located.¹

In so far as subordination to the commanding general, Services of Supply, was concerned, centers were more immediately under the jurisdiction of the chief surgeon, A. E. F., who (after the promulgation of General Orders, No. 31, in March, 1918) was also the chief surgeon of the Services of Supply; with yet greater particularity they were under the hospitalization division of his office.¹ After the armistice was signed and the Third Army advanced into Germany, its hospitals functioned in the Coblenz area virtually as a center, which also was under control of the hospitalization division. Eventually commanding officers of centers were given full authority in many matters. Thus, they were authorized to transfer and assign commissioned and enlisted personnel from one unit to another within their command without reference to higher authority, to promote or demote enlisted men up to and including the grade of sergeants, first class, Medical Department, to direct the disposal of all supplies received, to approve requisitions on the American Red Cross, employ civilian labor (under certain limitations imposed) authorize expenditures of Medical Department funds, convene special (but not general) courts-martial and issue necessary travel orders for patients transferred.¹ Bulletin 29, 1918, Services of Supply, A. E. F., conferred on center commanders all the authority of a post commander.¹ They did not have authority to approve for issue requisitions upon depots nor did they have jurisdiction over the engineers constructing the center.¹ On November 13, 1918, the judge advocate general, Services of Supply, ruled in reference to this matter that "the senior officer present of the department to which the formation belongs is the commanding officer, regardless of what other officers, line or staff, are present."⁷ All sick and wounded records were forwarded direct to the chief surgeon's office by each hospital, but other documents from those units were required to pass through the office of the center commander.¹

STAFFS

As no orders from higher authority prescribed the staff organization of hospital centers, each developed that organization which was most compatible with its needs and resources. Inevitably this led to some minor differences in such organization, but these were relatively few and unimportant. Thus at Mars,⁸ and Mesves,⁹ the commanding officer designated an executive officer, while at Allerey¹⁰ and Beaune¹¹ because of the shortage of officers and nurses, the commanding officers assumed the duties of that officer. At Allerey a chief dietitian for the entire center was appointed—an assignment which appears to have been unique.¹⁰

At Mesves the staff organization, consisting of 40 members, was as follows:⁹ 1 colonel, commanding officer; 1 major, executive officer; 1 captain, adjutant; 1 lieutenant, statistical officer; 1 major, quartermaster; 8 first lieutenants, assistants to the quartermaster; 1 captain, central purchasing agent; 1 captain, salvage and burial officer; 1 captain, supervisor of buildings; 1 lieutenant, medical supply officer; 1 lieutenant, motor transport officer; 1 lieutenant, assistant to motor transport officer; 1 lieutenant, railway transport officer; 1 captain, provost marshal; 4 first lieutenants, assistants to provost marshal; 1 intelligence officer; 1 captain, commanding headquarters detachment and band and fire marshal; 1 major, evacuation officer; 1 captain, assistant to evacuation officer; 1 captain, sanitary inspector; 1 major, medical inspector; 1 lieutenant colonel, medical consultant; 4 majors, medical consultants; 1 major, laboratory officer; 2 captains, assistants to laboratory officer; 1 chief nurse.

PROFESSIONAL SERVICES

Medical officers who were consultants in their respective specialties were designated as chief of their several services in each hospital center.¹ These officers were drawn habitually from the local personnel and, at first, performed their duties as consultants in addition to personal attendance on patients; however, as the centers developed, these officers found it necessary to delegate more and more of their personal practice to assistants.¹ The consultants in general medicine, general surgery, and orthopedics usually were members of the staff of the center, together with the center laboratory officer who, as described below, was in a somewhat different category. In some centers the consultants for each of the special services prescribed by general orders, A. E. F., were members of the staff. Whether on the center staff or not, designated consultants supervised the urological, X-ray, neurological, ophthalmological, maxillo-facial, and otolaryngological services, corresponding to the branches of the professional services of the American Expeditionary Forces.¹ Occasionally, in some centers, certain officers were designated who, to a degree at least, acted as consultants in other specialties; e. g., cardiovascular and cutaneous diseases. In general, the duties of consultants were as follows:¹ To investigate and report to the commanding officer on all professional matters within their jurisdiction, control professional emergencies, keep themselves informed of the qualifications and character of the service of their subordinates and of the equipment, service, and acute needs of the several hospitals, recommend changes in assignments and distribution of equipment, coordinate professional efforts, and disseminate

professional information.¹ Their services were purely advisory. In each base hospital the chief of a service performed the duties of a consultant for his specialty in so far as that unit was concerned, conforming his activities and policies to those of the consultant for the center, who, in turn, conformed to the policies of the chief consultant, in that specialty, of the American Expeditionary Forces.¹

CONSULTANT IN GENERAL MEDICINE

The consultant in general medicine was essential at all times but especially so in October and November, 1918, when the overcrowding in most centers facilitated the spread of epidemic diseases. His most important duties were the recommendation of assignment of personnel to the best advantage, recommendations concerning the control of infectious diseases, and the dissemination of professional information. He cooperated with other consultants in organizing the medical society of the center.¹

CONSULTANT IN GENERAL SURGERY

In the field of general surgery, the surgical consultant exercised duties altogether comparable to those of his colleague at the head of the medical service.¹ An important part of his work was checking and reporting to the chief consultant in surgery, A. E. F., the results obtained by hospitals further forward which cleared into the center.¹ Other important duties were recommendations for assignment of personnel, supervision and coordination of service, distribution of equipment to the best advantage, supervision of requisitions for supplies and dissemination of information.¹ Because of the limited quantity of instruments and some other surgical supplies available, it was especially necessary that patients requiring surgical or orthopedic treatment be concentrated in certain hospitals, and here he was especially active.¹ He also supervised instruction in minor surgery given to nurses and enlisted men. The subjects most considered in the classes organized for this purpose were anesthesia, practice in the application of dressings and splints and aftertreatment of battle casualties.¹ As the shortage of nurses in the American Expeditionary Forces necessitated the employment of enlisted men to a very considerable degree to perform nurses' duties the training of selected men was an important, continuing service.¹

CONSULTANT IN ORTHOPEDICS

The orthopedic consultant cooperated with the consultant in surgery in matters pertaining to instruction, assignment of personnel, obtainment and distribution of supplies, and similar duties. In a number of centers the consultant in surgery was also the consultant in orthopedics.¹

CONSULTANT IN MAXILLOFACIAL SURGERY

The center consultant in maxillofacial surgery was instructed to keep in view both the best possible treatment of the wounded and the early determination of those who would not be fit to return to duty within a reasonable time. It was not practicable to assign a specialist in this subject to each

center, but one most qualified among the general surgeons was in such cases assigned to this duty.¹² With him cooperated a specially qualified dental surgeon who performed the splinting and prosthesis required and gave such other care as came properly within his province.¹² He also consulted in a number of cases with the center oculist and center otolaryngologist.¹² Habitually, maxillofacial cases were concentrated in one hospital in each center, but when their needs required and their condition permitted they were transferred to the hospital center at Vichy, which was designated as the organization which would care for cases of this nature.¹² It was staffed and equipped accordingly. A number of cases were sent to American Red Cross Hospital No. 1 at Paris. Such patients as could not be transferred to the Vichy center or to the hospital at Paris, or whose transfer was not indicated, were retained in the center to which they had been admitted. It was not the policy to remove cases from the care of those who had shown interest and competence, except as the exigencies of hospital service demanded.¹²

CONSULTANT IN ROENTGENOLOGY

The center consultant in Roentgenology supervised and coordinated all activities in his specialty throughout the center.¹ Habitually he was also a member of the staff of some base hospital. Ordinarily only three hospitals in a center were equipped with the Army base hospital outfit for X-ray work, the other units being supplied with the Army portable machine and the bedside unit.¹ Supplies pertaining to this specialty were handled in a different manner from the others under control of the Medical Department, for requisitions for them were sent to the chief consultant in this service. He modified them if need be and sent them to the medical supply officer at Cosne for issue.¹ Some centers had abundant supplies while others needed them very badly. Electric current from French plants was utilized in some hospitals but in others S-kilowatt generators were installed for each X-ray plant in operation.¹

CONSULTANT IN UROLOGY

In most centers one officer was assigned to the staff as consultant in urology, dermatology, and venereal diseases, but in others one officer was charged with control of dermatology and another with the other specialties mentioned.¹ The dermatological service was especially developed in the convalescent camp at Mars. The consultant in urology, as the officer usually charged with these collective duties was designated, supervised the establishment and operation of prophylactic stations, both in the center and in nearby towns; he handled all venereal reports and statistics, supervised, directed, and coordinated the activities pertaining to his specialty throughout the center, promoted compliance with military orders concerning venereal disease, requested the personnel necessary for practice of these specialties, and received all reports, returns, and statistics pertaining to them.¹

CONSULTANT IN OPHTHALMOLOGY

In one hospital in each center a department was organized to which all cases in the center requiring ophthalmological treatment were sent.¹ This section was equipped as thoroughly as possible and staffed to the best advantage

by personnel drawn from any hospital in the center. The consultant, who was (at least nominally) assigned to this hospital, himself rendered professional service so far as practicable.¹ This department conducted an out-patient clinic to which patients, in such other hospitals as did not have proper equipment, were sent for refractions and minor operations.¹ All personnel including nurses and enlisted men on duty in this department were especially trained. The consultant in ophthalmology supervised and coordinated the ophthalmological work of other units, for these, as rapidly as equipment was received, organized their own departments where such cases were cared for.¹

CONSULTANT IN OTOLARYNGOLOGY

In the otolaryngological service, the consultant's duties were similar to those just mentioned.¹ Usually this service was conducted in some hospital other than that in which the center ophthalmological service was operated because of the limits of available space in any one unit for operating room bed capacity and other facilities.¹ The hospital designated for each of these clinics was adequately equipped in other respects as well, that is, X-ray, surgical, and isolation facilities, in order that these also could be used if necessary.¹

CONSULTANT IN NEUROLOGY

Psychiatric and neuropsychiatric cases were clearly differentiated, and habitually were segregated in different groups in respective hospitals.¹ Plans for hospital centers provided for a separate hospital unit, located at a quiet point on its outskirts, where psychiatric cases would be cared for, but in a number of centers this was never completed. The two classes of patients above mentioned were habitually cared for by different groups of specialists, both of which were under the general supervision of the neurologist for the center.¹ As resources improved, reconstruction facilities, such as those afforded by shop and art work for the rehabilitation of the neuropsychiatric cases, were rapidly developed, especially in the centers at Beau Desert and Kerhuon.¹

SENIOR DENTAL OFFICER

One or more dental officers were assigned to each hospital where minor and emergency work were performed.¹ Much of the more elaborate work of these specialists was performed at a central clinic, which was more thoroughly equipped than were the others, and was under the direct supervision of the senior dental officer, who was also in general control of the dental service throughout the center.¹ Like the laboratory officer, the senior dental officer was not a local representative of any member of the staff of consultants for the American Expeditionary Forces.¹ In professional matters he was directly under the senior dental officer of the American Expeditionary Forces.¹ As consultant he performed duties similar to those of other chiefs of service, but in a number of centers no consultant in this service was designated.¹

SPECIALISTS IN CARDIOVASCULAR AND DERMATOLOGICAL DISEASES

Specialists in cardiovascular and dermatological diseases were not, generally speaking, designated as consultants in all centers.¹ They were of special value in the convalescent camp, through which, in many centers, all patients

were made to pass before they were sent to replacement camps or depots.¹ Here medical officers examined all patients to determine the presence of the effort syndrome, and in this service cardiovascular specialists proved of essential value.¹ At Mars, all patients, before they were returned to full class A duty, were required to march 12 miles, after which they were examined.¹ At the same center a dermatologist examined all patients when they entered the camp and, when called in consultation, he also examined patients in other formations.¹ By his systematic methods he discovered that an unexpectedly large number of patients was suffering from cutaneous diseases, some of which were rarely found in civil practice.¹

LABORATORY SERVICE

The laboratories of the several centers were under the jurisdiction of the central laboratory of the American Expeditionary Forces at Dijon, which in turn was under the sanitation division of the chief surgeon's office.¹ The center laboratory officer was therefore in a somewhat different category, though in the same status as a consultant, as were the chiefs of the other professional services.¹ The general plan for the laboratory service of the centers was prescribed in Memorandum No. 8, from the director of laboratories, dated July 23, 1918, but the degree of centralization developed under that plan, varied among the different centers according to circumstances.¹ A center laboratory and usually a morgue were provided which supplemented the similar small installations operated in the several hospitals.¹ Autopsies usually were performed at the center morgue. In general, all work requiring use of animals, serology, water analysis, inoculations, and special pathological or chemical study was carried out at the center laboratory, and all other laboratory work was performed in the plants of the several hospitals.¹ The laboratory officer coordinated this service throughout the center and made appropriate recommendations concerning distribution of personnel, supplies, and duties.¹ At Mesves he was a member of a permanent board which, as stated above, was organized for the control of infectious diseases.¹

NURSING SERVICE

Each of the several centers had about 40 nurses to each 1,000 patients, distributed as most needed throughout the several hospitals.¹ The plan designating a chief nurse for a center, which developed in November, 1918, was soon applied in most of these formations. She was elected from among the nurses on duty in the center and exercised over their service a general supervision comparable in some respects to that of the consultants.¹ One of her most important duties was the distribution of the nursing personnel to the best advantage to meet the shifting needs among the different units.¹ Other duties were the following:¹ To meet incoming nurses and provide for their reception, systematize the rules and regulations governing the nurses, carry out the policies of the chief nurse, A. E. F., keep informed concerning the nurses' quarters, subsistence, social activities, and the care they received when sick, recommend assignments and transfers, keep a file of nurses' qualifications, act on all papers pertaining strictly to the Nurse Corps, and keep the commanding officer of the

center fully informed concerning the nursing personnel.¹ Nurses' hours were long and the strain on them severe, for their number was insufficient and for a long time their recreational facilities were almost nil, but after the armistice, when tension lessened somewhat, it was possible for them to enjoy recreation to a much greater degree than formerly. Small social affairs such as dances were very frequent and of great value in promoting morale.¹ Until March, 1919, social relations between nurses and enlisted men were forbidden, but in that month a circular from the chief surgeon's office directed that in social matters there would be no distinction between officers and enlisted men when off duty.¹ This circular was in conformity with a law recently enacted by Congress.¹

Centers located near cities sometimes furnished for nurses' use a limited amount of automobile transportation between the two communities.¹

SANITARY SQUADS

A number of sanitary squads, each consisting of 1 officer and 25 enlisted men, had been withdrawn from divisions which had been assigned to replacement duty and which for this reason no longer needed them, and were distributed among the hospital centers.¹ Some centers such as Mars, Mesves, Beau-Desert, Allerey, and Savenay had two of them.¹³ Usually, but not invariably, the commanding officer of a squad was assigned as the sanitary inspector of a center.¹ In certain centers, because of shortage in personnel, these squads were absorbed by other organizations and assigned to miscellaneous duties, but in others they retained their autonomy and were used for purely sanitary services—e. g., construction, repair, and direction of operation of sanitary appliances, such as incinerators, latrines, grease traps, etc.; inspection of water supply and sewer systems and of alterations in the same; operation of disinfecting plants; inspection and direction of proper sanitary operation of laundries and bathhouses; inspection of bakeries, butchers, kitchens, barracks, and provision of men as superintendents over details of special sanitary or police work; and preparation of all necessary reports in connection with the above services.¹

CIVILIAN LABOR

Without civilian labor the operation of hospital centers would have been very difficult¹ to a large degree, the only labor of this character available for the Medical Department consisted of French women, about 50 of whom were employed by each hospital.¹ It was found they could be hired, controlled, and distributed most efficiently by a central employment bureau which generally was operated by the quartermaster, but in some centers was conducted by other offices.¹ These employees served in various capacities, such as interpreters, cooks, waitresses, laundry workers, and scrub women, and were paid upon civilian rolls by the Quartermaster Department.¹ Their pay averaged about 5 francs a day when they were not furnished subsistence, or 3½ francs when furnished it. Some male labor also was employed by the Quartermaster Department in some centers to perform such labor as removal of garbage.¹

MEDICAL SUPPLY DEPOT

The personnel of a hospital center depot usually consisted of an officer of the Sanitary Corps, assisted by a chief clerk, returns clerk, and stenographer, and a warehouse force consisting of a noncommissioned officer and some 20 other enlisted men, among whom were the receiving clerk, who received, checked, and arranged supplies and checked cars, and the issue clerk, who made issues on approved requisitions.¹ The chief clerk kept the office records, which included a correspondence book, a requisition book, and a car book. The first contained records of letters received and sent. The second contained captions giving the number of each requisition, the date and place from which it was received, class of supplies called for, date requisition was filled, date shipped, voucher number, and name of checker.¹ In the car or receiving book were recorded the initials and number of each car received, by whom and when shipped, when received, contents as actually inventoried on receipt, date emptied, date goods were placed in warehouse, and the name of the checker.¹

From the medical supply depot of the hospital center articles were distributed locally among the several units, each of which had its own depot.¹ Because of the important and technical nature of this service, the medical depot at each center required exceptionally competent personnel. Eventually a number of men from each center were sent to the medical supply depot at Cosne or Gievres for a brief period of training.¹

Other records maintained in this office were a file of warehouse receipts, a special order book for emergency issues only, a file of retained copies of orders for supplies purchased, depot property returns, warehouse records (which included a copy of warehouse receipts), a special issue book and separate stock lists. Surgical instruments, poisons, alcoholic liquors were kept in a locked closet.¹

Medical supplies usually were classified and sorted in the following categories: Medicines, antiseptics, and disinfectants, surgical (including splints and dressings), dental, laboratory, X-ray, identification, furniture, and miscellaneous.¹

One of the most difficult problems connected with the administration of centers was obtaining medical supplies. Particularly was this true of those units which began to operate between July and October, 1918. Usually a base hospital unit had asked for initial equipment before leaving the United States and of its own efforts often had procured considerable material.¹ After the unit reached France its equipment did not arrive until one or more months later, and equipment received from depots was inadequate for the complete outfitting of all hospitals so that each could serve all classes of patients. Largely because of the restrictions on shipping space, to which all departments were subjected, and the lack of many articles in European markets, the chief surgeon, A. E. F., urged that the organization of these centers be made in such a manner that deficiencies could be compensated for by providing special equipment for only a fraction of the hospitals present.¹ Supplies that could not be procured from A. E. F. depots were obtained to a limited degree by purchased in the open market or from the American Red Cross.¹

MOTOR TRANSPORTATION

In each of the large centers an officer of the Motor Transport Corps was assigned to duty with personnel which usually was insufficient.¹ At no time before the armistice was motor transportation adequate.¹

All motor transportation at centers was pooled and vehicles were furnished only on signed requests of the commanding officers of units.¹ Supplies were delivered from the depot by trucks assigned to that duty and much hauling was done at night. Experience led to the conclusion that a center of 15,000 beds with the most favorable arrangement of buildings, railway spurs, depots, and roads would require 15 trucks of from 3 to 5 tons, 15 light trucks of three-fourth ton, 12 G. M. C. ambulances, 2 touring cars (7-passenger) 5 touring cars (light type), and 12 motor cycles with side cars.¹

It became fully apparent that for several reasons all motor equipment should be standardized.¹

After the armistice was signed, evacuation ambulance companies became available for the purpose and were stationed at a number of centers.¹ Each of these companies consisted of 1 officer, 39 enlisted men, and 12 G. M. C. ambulances, in some centers operating under the evacuation officer.¹ They answered local calls as well as calls from outlying organizations which had no transportation, served in the evacuation and loading of hospital trains, and, in emergencies, carried supplies. Their vehicles were also used to convey the remains of the dead.¹

A central garage and repair shop was provided in each center.¹

DISINFESTING PLANT

Central disinfecting plants were established in most centers for there were not available in France enough mobile disinfestors to serve all units individually.¹ In some centers this communal plant was assigned for one day each week to each unit. One plant at Mesves, for example, by operating day and night did all the work of the center for almost a month. In some other centers portable disinfestors were furnished the units caring for the most serious cases, other units employing a central disinfestor of the Canadian hot-air type in the convalescent camp.¹

FIRE DEPARTMENT

Fire control at hospital centers was under the general jurisdiction of the bureau of fire prevention, Services of Supply.¹ Fire fighting apparatus, including chemical engines, ladders, hose, buckets, barrels, and extinguishers were obtained through it. Fire regulations were promulgated in each center. Each hospital and other unit organized its fire-fighting force and conducted drills under the general supervision of the fire marshal of the center.¹ Fire risks in barrack hospitals were very great; fortunately, however, no serious conflagration occurred in any center.¹

SALVAGE OF PROPERTY

The salvaging of property of whatever character was an important and extensive undertaking.¹ Each center provided a salvage dump where material coming for the separate hospital units was sorted, cleaned, renovated if pos-

sible, and either redistributed locally or shipped to a central salvage depot.¹ The principal classes of supplies salvaged were: Clothing, ordinance, boxes, bags, crates, paper, metal scraps, tin cans, grease, garbage, and writing paper.¹ Clothing was disinfected, laundered, repaired, renovated, and, if possible, reissued; otherwise it was sent to a central salvage depot. Mess kits were assembled and placed in stock for reissue.¹ Gas masks, helmets, and rifles were cleaned and transferred to any neighboring replacement camp or were shipped to a large salvage depot.¹ Boxes, crates, etc., except such as were needed for use at the center, were shipped in returning cars to large salvage depots. Tin cans were cleaned in boiling water at each hospital, flattened at the center salvage dump, and then shipped to a local salvage depot. Grease was saved by the units and generally used for making soap; several centers had efficient soap factories.¹ Garbage was reduced to a minimum by food saving; one hospital with 540 ambulant patients had less than half a can of garbage daily. That remaining was disposed of either by a central incinerator, by sale to French civilians (an arrangement which gave very different degrees of satisfaction), or at the center's pig farms.¹

FARMS

At several of the centers, especially that at Savenay, farms and gardens were operated successively and arrangements were under way for their provision at almost all centers when the armistice was signed.¹ Land for this purpose was procured through the American Expeditionary Forces garden service, and whenever possible animals and manure were provided from neighboring veterinary hospitals. Implements were procured through the garden service, the American Red Cross, or from hospital funds. Seeds and plants were supplied by garden service; labor was performed by volunteers from the convalescent camp. Farms that were most highly developed were equipped with a small barracks and appurtenances for 100 men and a dispensary, the convalescent camp exercising medical and disciplinary supervision over the personnel.¹

Pig farms proved especially lucrative, the animals being subsisted on garbage from the center.¹

CEMETERIES

On request of the Medical Department, land for cemeteries was acquired in the vicinity of all large centers, or permission obtained to make interments in French cemeteries.¹ Laws in France were such that new locations for cemeteries could be obtained only after compliance with a number of requirements, but through the graves registration service these were complied with, sites obtained, and arrangements made for their control and maintenance, and for the proper marking and preservation of graves.¹ Graves were dug by personnel assigned to the quartermaster. The chaplain of the unit in which a death occurred conducted funeral services, except when the deceased belonged to another denomination, in which case, if at all available, a chaplain of the same faith officiated.¹

CHAPLAINS

A chaplain was to be assigned to each base hospital unit, primarily to minister to both patients and personnel. There was never a full quota of these officers in the American Expeditionary Forces, in so far as hospital units are concerned, for which reason each chaplain habitually performed duties in several hospital units, including that to which he was specifically assigned.¹ All chaplains in a center were under the supervision of the senior chaplain present, who distributed the services of his colleagues to the best advantage.¹ The senior chaplain supervised recreational and entertainment activities, conducted services for the group weekly, was responsible for the proper conduct of funerals, and in some centers was liaison officer between the hospital center and the graves registration service, reporting to that organization all interments and supervising the proper marking of graves. The last-mentioned duties were sometimes delegated to a junior chaplain.¹

AMERICAN RED CROSS ACTIVITIES

American Red Cross activities in the center were supervised and coordinated by the representative of that service on the staff of the commanding officer. They were concerned chiefly with home and hospital service, recreation, and procurement of hospital supplies. The home and hospital service had one or more workers in every hospital who assisted in tracing the missing, distributed chocolates, cigarettes, and other articles of this kind, to incoming patients and throughout the wards. An important part of their service was the writing of letters for disabled patients.¹ As mentioned above, Red Cross activities in promoting recreation were coordinated with those of the chaplains and were under their general control but more immediately under the direction of the Red Cross worker in charge of the Red Cross hut.¹ Here a library, reading and writing rooms were provided, a piano or phonograph installed, and space was available for presentation of vaudeville or moving-picture shows, and such social diversions as dancing and receptions. In the provision of medical supplies the American Red Cross supplemented the Medical Department, sometimes furnishing articles in very large quantities.¹ Requisitions from units habitually passed through the center commander before being referred to the American Red Cross. This organization maintained in many centers a small depot where there was a rapid turnover of the delicacies, stationery, toilet articles, and similar supplies which it distributed to personnel and patients.¹

RECREATIONAL ACTIVITIES

Even before the armistice, entertainment of patients and personnel was an important element of center service, which was under the general supervision and control of the senior chaplain.¹ In the several units the chaplains organized recreational activities, promoted sports, provided moving picture and other shows and organized similar diversions, but it was not until after the armistice was signed, when pressure of other duties relaxed, that this service attained its

highest development.¹ There was a general exchange between units throughout each center of entertainers drawn from the personnel or patients. A number of others, including many professional entertainers sent overseas to serve the troops in this capacity and volunteer companies organized by other units, greatly promoted this service during the armistice.¹ If a band was not assigned to a center by higher authority, one usually was organized in its convalescent camp, and orchestras were developed in a number of units. The orchestra developed by the center at Mars, comprising over 70 pieces, was a remarkably fine organization. Instruments for bands and orchestras usually were furnished by the American Red Cross, which cooperated with the chaplains in furnishing diversion and were in immediate charge of a number of details connected therewith. The recreation huts provided, so far as possible, for each base hospital were erected at the expense of the American Red Cross, and a Red Cross worker was immediately in charge of the social and recreational activities in each.¹

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CHAPTER XXII

A TYPICAL HOSPITAL CENTER

HOSPITAL CENTER, ALLEREY ^a

PHYSICAL CHARACTERISTICS

The hospital center at Allerey was on the outskirts of the town whence it took its name. Allerey, at the time, was a town of some 800 inhabitants on the Paris, Lyon, & Mediterranean Railroad, in the Department of Saone-et-Loire, approximately 11 miles north of Chalons-sur-Saone, the largest town (population, 30,000) of the department. The center was about three-quarters of a mile from the Saone River, which was at once, in effect, the source of its water supply, and a line of communication over which fuel and other supplies were brought to the center when access by rail was obstructed.

The site of the reservation covered an area of 172.3 acres, which consisted chiefly of farmland, but included some swampland at the eastern end and some woodland at the western. The site was low, and generally very level, most of it (e. g., section 4) being lower than the edge, so that proper drainage was difficult.

The soil consisted of a layer of loam, from 6 inches to 2 feet in thickness, superimposed on clay; and though rainfall readily percolated to the clay stratum protracted rains soon saturated the upper layer.

Climatic conditions during the existence of the center offered nothing unusual for this region. The summer of 1918 was hot, dry, and at times windy; spring, autumn, and winter were rainy, with almost constant cloudiness during the last-mentioned season, and marked by cold of a penetrating character, but without very low temperature. Rainfall averaged 840 mm. per annum; the mean temperature was 10.52° C.

HOSPITAL CONSTRUCTION

The outlay of the hospital center comprised 13 sections and a cemetery; 10 of the sections were to accommodate 1 base hospital each, 1 a convalescent camp, 1 the quartermaster and motor transport departments, and 1, secluded from the rest, a psychiatric unit. Each base hospital was to accommodate 1,000 patients with attendant personnel and to supplement its capacity by tentage for 1,000 beds—more if need be. These tents were to be pitched in the "crisis expansion" areas provided in the rear of the wards. Each hospital was to be a unit complete in itself, except for transportation and certain other communal elements. Such a unit consisted of 55 buildings apportioned as follows: Administration; reception and evacuation; dining rooms; kitchens; bathhouses and latrines for patients, nurses, and officers; wards; recreation hall; laboratory and morgue; X ray and clinic; operating; quartermaster and

^a The statements of fact appearing herein are based on "History of the Allerey hospital center, A. E. F.," by Col. J. H. Ford, M. C., commanding officer. On file, Historical Division, S. G. O.

tories, formed the exterior walls. Roofs and floors were formed of 1-inch boards, the former covered with tar paper. Partitions to form rooms were made of 2 by 4 studding and beaver board. Practically all buildings were 6 meters wide, but varied in length from 10 to 50 meters. This type of building was constructed very rapidly, but in many instances settling occurred because of the softness of saturated ground, and cracks in exterior walls developed. The tents employed were of the marquée type and of French manufacture. Their floor dimensions were 17 by 35 feet, so that three tents, connected end to end, accommodated 50 beds. Such sets of tents to accommodate 500 patients were erected back of alternate wards in most but not all of the hospitals, there being an insufficiency of tents thus to equip the entire center. Though location back of alternate wards caused some lack of uniformity and balance in ward service, this method was adopted to lessen fire risk.

On February 16, 1918, the Engineer Corps began to lay out the site of the center and to supervise the activities of the civilians who had contracted for its construction. In the latter part of that month the wall sections of the portable buildings arrived in such quantities that the freight house at Allerey station was soon filled and 109 cars were unloaded at St. Loup, a neighboring village. Bad weather hampered the work to such an extent that by March 23 only 10 buildings had been erected, and the roads were in such condition that only slow-moving ox teams could force their way through.

From the outset the labor problem was difficult. Old men, boys, and those unfit for military service were the only French laborers available, so that it was necessary to recruit workmen for the project in other countries, especially in Spain. For this purpose agencies were maintained by the French and American Governments and in some instances by the contractors themselves. Labor procured in this manner, however, was of a very inferior quality, requiring constant supervision. Also the practice of contractors of padding their pay rolls required a constant check by the constructing engineer. Company C of the Twenty-sixth Regiment of Engineers arrived on May 19, and from that date construction proceeded much more rapidly. Eventually a labor company was assigned to the center, and its number augmented by 40 German prisoners and 20 Russians. These last had been sent to France as part of a military force in the early months of the war. Highly important work in construction was performed by enlisted men of the Medical Department and by convalescent patients. As fast as base hospital units arrived, their personnel was engaged in completing the construction in the areas to which they had been assigned, and continued on this duty even after they received patients. Throughout the life of the center, selected men were detailed for special work such as electric installations, motor repair, operation of stationary engines, etc. Similarly convalescent patients were employed in large numbers for work of every kind according to their strength and ability, and this practice expedited greatly the construction of the center. However, as orders required that patients be returned to duty as promptly as possible, a very rapid overturn of such personnel was necessary, and completion of technical work, especially, was delayed to a considerable degree by the constant necessity for finding replacements for skilled workmen transferred.

Temporary roads were early laid out by the engineers and graded, but on account of lack of road material many became quite unsatisfactory after rains commenced. At first cinders were used as surfacing material, but because of wet weather and constant passage of heavily laden vehicles the roads were soon cut to pieces and some became impassable. Later crushed rock was received in quantities and distributed where most needed. A steam roller was operated in some sections of the camp. After the armistice was signed, 10,000 feet of duck board were procured and laid in those parts of camp which needed it most; and after January 1, 1919, some corduroy roads of railway ties were laid.



FIG. 88.—Reservoir, Allerey hospital center

The water supply was drawn by pumps, driven by gasoline motors, from three wells averaging 55 feet in depth sunk 200 yards from the bank of the Saone at the east end of the camp. A booster pump then forced the water through an 8-inch main into the supply system of the several units, and the surplus into a reservoir containing 100,000 gallons at the west end of camp. The capacity of the pumping plant varied from 20,000 gallons daily in August to 50,000 gallons in December, depending on the rate of inflow into the wells. A 4-inch pipe which could be cut off at its point of junction with the main line supplied each unit, and eventual distribution in them was effected through pipes from $\frac{3}{4}$ to 2 inches in diameter. As the central chlorinating apparatus was never satisfactorily installed, water was sterilized by the Lyster bag method in all units.

A sewerage system for liquid waste was installed. It consisted of a main 12 inches in diameter, with ramifications 4 to 6 inches in diameter, reaching

the receiving wards, operating rooms, kitchens, and laboratory of each unit. The system was not originally intended for the reception of urine, but eventually it was used for that purpose. The sewage was discharged into a concrete sedimentation tank one-quarter of a mile north of the center. Here it was chlorinated in accordance with the requirements of the French regulations on this subject and the clarified effluent discharged through an open ditch into the Saone.

Before this system was installed, liquid waste was removed by barrels carried in a motor truck, and later by a steel tank wagon. Because of inability to procure pipe installation the sewer system was long delayed and removal of liquid waste continued to be a grave problem for some elements of the camp even after the tank wagon service was effected.

Original plans had called for a high-tension line from Chalons to furnish electric light and power, but this project was abandoned. Instead, five small 25-kilowatt electric light and power sets, each to serve two sections, were gradually installed, but as their output was small and each required constant, skilled attention, this arrangement was never satisfactory. It was particularly inadequate when later required to serve 12 sections instead of 10. Illumination was never brilliant, and when patients arrived at night, as they often did, current was not sufficient to illuminate properly the receiving stations, wards, and operating rooms, and to actuate the X-ray plant. Despite fire risk, it was necessary to supplement the electric light by lanterns in various parts of the center and at all times to exercise the most meticulous care in the proper usage of current. Exterior lights had not been provided in plans for the center, but these were authorized when their need became manifest.

Throughout the operation of the center, until toward its close, there were frequent interruptions in construction and in the operation of certain utilities. At times, for various reasons, the output of the pumps was limited or discontinued. Reception of building materials or other supplies was interrupted by embargoes, railway delays, or nonavailability at depots. The electric-light output was at times reduced or perhaps suspended. In the original plans no provisions had been made for offices or quarters for the headquarters group, post office, and certain other elements, but these were promptly authorized and constructed.

As the center developed, and as the pressure of essential work decreased, certain public-spirited individuals in every unit charged themselves with the beautification of grounds and improvement of buildings. As a rule, the commanding officers of these units, while encouraging this, left plans and work of this character to those who were interested, believing that thereby they would secure greater enthusiasm. Rivalry in the beautification of wards, recreation halls, dining rooms, etc., was evidenced even at the period of greatest pressure. In the convalescent camp decoration of grounds was carried to a high point and a number of artistic effects secured, in differently colored stones, evergreen plants, etc. Especial care was given the cemetery. Many floral offerings from French citizens and inmates of the center, as well as the painstaking attention to paths, turf, shrubbery, and the markings of graves and boundaries attested the reverent remembrance of the dead.

ORGANIZATION

Organization of the hospital center at Allerey was commenced June 23, 1918. On June 20, Base Hospital No. 26 had joined, being the first organization of this character to arrive. Its commanding officer, relieved from further duty with the hospital and assigned to command of the center, organized the headquarters staff from the personnel of Base Hospital No. 26, but for several weeks the staff continued to function to a diminishing degree in the positions which they had occupied in the hospital until understudies could be trained. This initial staff comprised the following departments: Adjutant, quartermaster, medical supply, receiving and evacuating, sanitary, and railway transportation. A few days later representatives of the American Red Cross and of the statistical branch, Adjutant General's Department, arrived and joined this staff.

As in other hospital centers, each staff officer at first had several positions. Thus at Allerey the commanding officer performed the duties of executive officer and, at first, inspector; the adjutant was also judge advocate, personnel and statistical officer; the quartermaster was charged with motor transport duties and immediate responsibility for those activities which were later assumed by subordinates under his general direction. The sanitary inspector was also laundry officer, fire marshal, supervisor of buildings and grounds, etc. No detailed instructions covering the administrative organization of the center were received, and development progressed as determined by force of circumstances and existing resources. Throughout this formative period staff duties were clearly delimited so that as occasion arose they could readily be distributed among individuals who could give them their undivided attention. Until the close of the center, however, a number of officers continued to exercise the duties of several positions. Assignments to the headquarters staff were a continuing problem, for only a few staff officers arrived from extraneous sources, and officers already on duty in the center who possessed administrative ability were needed in their several units to meet the great expansion which these underwent through the establishment of provisional hospitals, overcrowding, etc. Pressure was such that the loss by any unit of one or two good administrators was felt at once locally, and the local deficiencies in service arising therefrom had to be met by increased activities at headquarters. The situation was ameliorated to a degree by the assignment to the center from other points of officers for service with the convalescent camp, motor transport, engineer, military police, statistical bureau, medical supply, and the quartermaster department. Also a number of officers undergoing treatment in the convalescent camp assumed some very important duties—e. g., commanding officer of the interior guard and assistants to the receiving and evacuating officer—so that during their stay in the center they promoted greatly its staff activities.

The specialization of headquarters, developed to its final organization, was as follows:

- Commanding officer.

- Adjutant.

- Personnel officer.

- Statistical officer.

- Civilian employment officer.

- Commanding officer, headquarters detachment.

- Post-office service.

- Banking service.

Quartermaster.
Subsistence.
 Center purchasing agent
 Sales commissary.
 Bakery.
 Butchery.
 Ice-plant farm.
Clothing, equipage, etc.
Finance.
Laundry.
Animal-drawn transportation.
Utilities.
Salvage.
Commanding officer labor battalion, etc.
Cemetery.
Interment.
Motor transport officer.
Ambulance company.
 Truck company.
 Repair shop.
Medical supply officer.
Receiving and evacuating officer.
Inspector.
Sanitary inspector.
 Inspection of buildings and grounds.
Fire marshal.
Signal officer.
Engineer officer.^b
Assistant judge advocate.
Assistant provost marshal.
Commanding officer of the interior guard.
Intelligence officer.
Ecclesiastical officer.
Railway transportation officer.
Center laboratory officer.
Consultants in professional services:
 General medicine.
 Psychiatry and neuropsychiatry, cardiovascular.
 General surgery.
 Orthopedics.
 Ophthalmology.
 Otology, rhinology, and laryngology.
 Roentgenology.
 Neurology.
 Urology.
 Laboratory officer.
 Consultant in dentistry.
 Chief nurse.
 Chief dietitian.
 Red Cross officer.

^b This officer was one who had been selected from the patients in the convalescent camp. As noted below the engineer who constructed this center was never a member of the staff of its commanding officer.

After September 20 a center officer of the day, chosen by roster from among the available captains, was detailed to inspect patients' messes, assist the receiving and evacuating officer, if required, inspect the guard, and meet emergencies.

An executive officer was never detailed as in the hospital centers at Mars and Mesves. The duties of his office were divided between the commanding officer and adjutant, the former charging himself with all executive administration, the coordination of the activities of the staff departments, direct supervision of units, important correspondence, and leaves of officers.

ACTIVITIES

COMMANDING OFFICER

The commanding officer held conferences at 1 p. m. daily, except Sunday, which were attended by heads of staff departments and commanding officers of units. The constructing engineer, who was not under the jurisdiction of the commanding officer of the center, was invited to attend either in person or by representative and habitually did so. At these staff meetings the fullest discussion was invited and suggestions and recommendations sought on all subjects relevant either to the interior service of the center or to its external relationships. Most written orders were emitted only after their purport had been fully considered at these conferences by all parties concerned, their scope and limitations determined and, if necessary, their provisions clarified. By this means several ends were attained, the most important being the engendering of a spirit of cooperation, the formulation of orders in such a manner that they seldom had to be revised, despite the mutations incident to the growth of the center, and the avoidance of misinterpretations. Each officer concerned was encouraged to feel that he had an important influence in the formulation of orders concerning activities of his department; and this was believed to have promoted the solidarity of the center and smoothness of cooperation much more than could have been effected by autocratic methods. In some instances, however, as need arose orders were issued without consulting subordinates. Most orders, instructions, etc., that were of temporary or individual interest were given verbally by the commanding officer at these meetings to those concerned, who made record of them in their notebooks at this time; but orders affecting communal service or of more permanent interest, whether from higher authority or of local origin, were issued in the form of special orders or memoranda.

Similarly, staff meetings were held by the several chiefs of professional services. At these sessions professional activities were coordinated, and, so far as was feasible and reasonable, standardized throughout the center. In this field, however, individualism in methods of treatment was encouraged rather than restricted, provided results achieved were satisfactory, except that in some fields of endeavor (e. g., control of infectious diseases, débridement of wounds, etc.) orders issued were mandatory.

A stenographer attended all staff meetings and made of record discussions, verbal orders, etc. These notes were read at the next staff meeting like the

minutes of a board of directors, and were open to inspection of any person concerned who later wished to refresh his memory on any point.

The commanding officers of units also held conferences with their subordinates daily except Sunday, when in a manner comparable to that at headquarters all items of interest, whether administrative or professional, were discussed and appropriate orders given.

The commanding officer of the center and those of the several units were accessible to any member of their commands daily during hours set aside for that purpose. The object of all these measures was to have the center and the several units respectively as highly centralized as was reasonable without infringing unduly, in the first instance, upon the prerogatives of unit commanders, and in the second upon that of individual officers on duty in the units, and that in determining the manner and degree of centralization officers concerned should have a constructive share. Apparently centralization was carried further at Allerey than at other centers for the reason that in proportion to its resources it cared for more patients during a certain period than did any other. In order to secure the fullest coordination a corresponding degree of centralization was imperative.

Each unit was allowed the fullest possible freedom in interior organization and administration, subject to existing general regulations. In order that each unit might have the benefit of acquaintance with methods evolved in others, the commanding officer of the center and his staff, accompanied by the commanding officers and staffs of the several units, visited each hospital in turn, in order that all concerned might acquaint themselves with respective methods of service. There was thus promoted mutual acquaintanceship and a free exchange of ideas throughout the center. The result was an amiable rivalry extending to every element of each unit and prompt application of new ideas wherever found. It was interesting to note, however, that many of the ideas thus exchanged were modified in greater or less degree when applied in hospitals other than that in which they had their inception. Sometimes this was due to differences in local requirements or resources; more frequently to differences in the personal coefficient of the administrator or other personnel concerned, who found that they secured better results with methods to a degree individualized. The results showed the advisability of leaving to unit commanders and to the members of their staffs the largest latitude possible in the discharge of their respective duties.

ADJUTANT

The adjutant promulgated orders, acted on furloughs of enlisted men, and on charges preferred, reviewed court-martial proceedings and acted for the commanding officer on questions which did not demand the latter's attention. In addition, he was charged with routine administration and correspondence, preparation and issue of all court-martial orders and those affecting audits of public vouchers, examination of requisitions and ration returns, command of the headquarters detachment and supervision of the sergeant major's office. Under his supervision units longest in the center instructed newly arrived units in orders, customs of the service, use of blank forms with

which they were unfamiliar, etc. Instruction in some subjects, however, was given by selected officers, usually those more immediately charged with their execution; e. g., receiving and evacuating officer, fire marshal, sanitary inspector, the chiefs of professional services, and others. The three base hospitals which first arrived were employed as schools for the instruction of later arrivals. As soon as a new hospital reported, its adjutant, registrar, mess officer, sanitary officer, sergeants (first-class), and clerks, were distributed for instruction to one or the other of these hospitals, and remained there until they became fairly familiar with the records and their own hospitals were ready to receive patients. Usually this was a period of about two weeks. Similarly, at the direction of the commanding officer of the center, the adjutant directed the professional personnel, in conformity with the recommendations of chiefs of services to visit these hospitals and familiarize themselves with both professional and official standards required. The adjutant apportioned numerous duties among his assistants. One of these was an officer from the statistical department of the adjutant general's office who joined in July, 1918.

The sergeant major's office, under the adjutant's jurisdiction, was divided into the several sections noted below. The reports prepared and forwarded by it are mentioned in the preceding chapter, which discussed hospital centers generally. The personnel section of the sergeant major's office consolidated all data pertaining to personnel on duty in the center, other than those serving with the engineers, forwarded appropriate reports concerning them, except that the daily and weekly numerical reports were formulated by the statistical section, and kept up rosters of officers, nurses and enlisted personnel. Those for officers and nurses were entered on file cards, which carried notations concerning military status, professional and administrative aptitudes, etc., while the roster for enlisted men was kept up by appropriate entries on a copy of the muster roll of the organizations to which men belonged. The preparation of a card index for enlisted personnel, though its desirability was recognized, was not feasible with the clerical resources available. These rosters, especially that of the officers, proved of great value in making details to meet the ever-shifting needs of the center.

The statistical section checked the accuracy of all reports received from units concerning patients, consolidated these for transmission to higher authority (except those noted below under the receiving and evacuating section), formulated the daily bed reports and collective numerical reports of patients and personnel, consolidated daily reports of all cases of infectious diseases, whether among duty personnel or patients, and placed these last-mentioned data at the disposal of the sanitary officer. The head of this section was charged with the engagement, supervision and discharge of all French civilians employed in the center by the Medical Department. Such female employees to the number of 50 for each hospital were authorized by the chief surgeon, A. E. F., subject to rates of pay and terms of service required by him and the civil requirements of the French Government. These women were assigned to duty under the supervision of the chief nurses of the hospitals and by them distributed to best advantage. In order to promote prompt reply to the many queries received from outside points concerning individual patients, the statistical

bureau maintained a card-index file for all patients, showing name, serial number, official designation, location in center (with notes of all transfers, even from ward to ward), date of evacuation, classification (A, B, C, or D) and destination, or date and cause of death and number of grave. This index was in constant use. In order to expedite the delivery of mail until the post office prepared its own card index, that office consulted it during the night.

The receiving and evacuating section was closely associated with the statistical section. It prepared all the reports concerning the reception, distribution, classification, and evacuation of patients other than the daily and weekly statistical (numerical) reports. It was responsible for the service records of outgoing patients and for the completion of their records.

The order and record section received the orders from higher authority, as well as those of local origin, recorded and promulgated them. It checked, consolidated, and forwarded the records of the various activities of the center not covered by other sections of the adjutant's office. Thus, it handled requisitions for medical supplies and blank forms, reports of progress of construction, of transportation facilities, pay rolls of marines and of civilian employees, statements of hospital fund, reports of purchases from funds allotted the commanding officer of the center and the commanding officers of units, ration returns, reports of fire marshal, etc. This section eventually had custody of all documents as they found their way into the files.

The filing, distributing and mailing section was charged with the upkeep of the index of all orders, reports and correspondence, the proper filing of papers, delivery of all documents throughout the center and obtainment of receipts for same, verification of addresses on envelopes of outgoing official mail and on telegrams, recording date when such were sent. The officer in charge of this bureau supervised the post-office activities in the center.

As commanding officer of the headquarters detachment, the adjutant supervised the assignment of its personnel and kept in the detachment office all records concerning them. His duties also included supervision of the property officer for the headquarters office, of the courier service of the post-office service and of the activities and protection of a branch bank which was established in the center.

COURIER SERVICE

Important papers, destined for headquarters, intermediate section, Nevers, and for the office of the chief surgeon, A. E. F., at Tours, usually were sent by courier, and were received from these offices in the same manner.

POST OFFICE

Post-office activities in the center began July 6, 1918, but not until August 25 was the center given its post-office number, viz, A. P. O. 785. At this time the office was moved into a building provided for it near headquarters. In September, 1918, money order and registered mail departments were organized, service in both increasing rapidly. By December, 1918, the value of the money orders handled monthly was \$20,000. By November, 1918, the service handled daily approximately 40 pouches of incoming mail and 10,000 outgoing letters. At this time the service was reorganized and a card-index file was formulated

similar to that at headquarters, carrying the names of all personnel in the center so that prompt delivery of mail was feasible. The eventual success of this service had a very important influence on morale.

BANK

In November, 1918, at the invitation of the center commanding officer, the Chalons branch of the Société Générale opened a branch bank in the center. The military police furnished guards for the movement of funds back and forth between the center and Chalons, and the motor transport park furnished transportation for funds and personnel. The bank proved to be a great convenience; in addition to cashing checks, it sold bonds of the fourth French loan. Banking hours were from 10 a. m. to 4 p. m. on Mondays, Wednesdays, and Fridays.

QUARTERMASTER

The group quartermaster had general charge of the activities of that department.

The subsistence branch of his service was charged with those duties which its name implies. For several weeks after the first hospital arrived, bread and fresh meat were hauled from Dijon by truck, but after patients began to arrive in considerable numbers motor transport proved inadequate and a shuttle railway car convoyed by an enlisted man was put in operation. This shuttle service was continued for this purpose for about six months, until a bakery was established in the center and fresh meat was shipped in direct from depots. It was used for the transportation of soiled linen to a civilian plant in Dijon. Subsistence supplies, other than bread, were eventually received by automatic supply from the base stations and distributed by the quartermaster of the group to quartermaster units. This method of supply required about 10 cars daily but at one period (November and December, 1918), when the center was operating at its maximum and about 23,000 rations were required daily, as many as 27 cars were received in one day.

In order to meet increasing needs, a group purchasing agent was detailed. His office consolidated the requisitions of the several units for the procurement of fresh vegetables, eggs, milk, etc., not obtainable from depots. Such an arrangement was necessary in order to prevent the several hospitals from bidding against one another in local markets, to effect savings by purchasing in large quantities, to prorate available supplies according to needs, and to extend the radius of purchases beyond points accessible to the units themselves. These supplies were often bought in distant markets; e. g., potatoes in Brittany, eggs in Algiers.

To relieve congestion in the group warehouse and to meet needs that might arise because of unexpected expansion, unit commanders were required to keep on hand nonperishable comestibles to the limit of their facilities, viz, about two months' supply. This measure proved fortunate when the center expanded rapidly in October, 1918, for neither condition of roads nor available transportation would have permitted satisfactory commissary service if unit warehouses had not been well stocked.

When fresh meat began to arrive in quantities, it was at first stored in a cooling room erected in the warehouse after plans furnished by the chief quartermaster, Services of Supply. This room was simply a box 20 feet square and 12 feet high, with walls and roof 1 foot thick. These walls were filled with packed sawdust and provided with very carefully fitted doors. The frozen meat soon brought the temperature of this room down to a point which permitted one week's supply to be kept on hand without ice. Later an ice plant was built, with an output of 1 ton of ice daily, and in conjunction therewith a cooling room where 50 tons of meat, fresh vegetables, etc., could be stored.



FIG. 89.—Exterior view of warehouse, Allerey hospital center

A sales commissary was organized promptly after the organization of the center, but it was soon found that direct sales by it alone could not meet requirements. Many patients were physically unable to visit the salesroom and attendants often did not have time to do so. The American Red Cross workers in units purchased articles in greatest demand (e. g., tobacco, confectionery, etc.) to the limit of their storage facilities, and resold these at cost to enlisted men, whether patients or duty personnel; articles for similar resale to officers and nurses were handled by the unit mess officers. All such sales were in addition to those made direct to individuals, whether commissioned or enlisted, by the sales commissary itself, and were in effect an extension of its service throughout the center.

A bakery was established by Bakery Company No. 357 in August and thereafter was gradually expanded to 7 ovens. By October, it was turning

out 27,000 pounds of bread daily, and continued this output for several months, though less than half the bakery company had joined. This output, made possible by day and night shifts, was not quite equal to demands, however, at the high-water mark of the center, and several shipments from the bakery at Dijon were necessary to meet requirements.

Butchery Company No. 331, assigned to duty in the center, was distributed among the several hospitals, where its personnel gave instruction to cooks in the care and cutting of meats.

The property branch of the Quartermaster Department supplied fuel, forage, gasoline, clothing, equipage, ordnance, etc. Wood and forage were purchased locally, coal was shipped in from base ports, and other articles handled by this department were drawn from depots. It was necessary to keep on hand a large supply of clothing and equipment, because of the rapid overturn of patients, whose average stay in hospital was but 17 days, and who, on evacuation, had to be fully clothed and equipped. The quantity on hand at one period was sufficient for 40,000 men and approximated in value \$1,000,000. As no buildings were available for the storage of such a quantity, the bulkiest articles were stored without injury under paulins, on platforms built for this purpose. No shortage of fuel or clothing occurred at any time.

The finance section disbursed all funds other than those allotted to the commanding officers of units by the chief surgeon, A. E. F. Commutation of rations and liquid-coffee money were paid by the group disbursing officer, but unit quartermasters made monthly payments of patients and personnel of their respective organizations. The monthly disbursements usually approximated \$500,000, but for several months were 20 per cent greater than that figure.

The laundry service of the center was a grave problem from the opening of the center until toward its close. Some of the laundry was done under contract at Dijon, 34 miles distant, linen being sent back and forth, first by truck and later, as mentioned above, by shuttle railway car. All resources in that city soon proving inadequate, a hand laundry was organized at Verdun-sur-Doubs, 2½ miles from the center. A laundry barge was hired, 30 French washerwomen employed and 15 marmites erected. Later two portable laundries were received and operated by day and night shifts. The output of these establishments was about 200,000 pieces per month. During September, 1918, several truck loads of hospital linen were handled by the portable laundries at Beaune, when circumstances permitted that they give this assistance. In October, the steam laundry at Beaune, designed to serve both that center and Allerey, began operations, and as soon as it was able to meet demands of both centers all other service of this utility was discontinued. The laundry at Beaune was operated on day and night shifts, but its output never reached that at Mesves, which had been designed to handle 600,000 pounds monthly. The largest number of pieces done for Allerey in any month was 300,000 pieces during December, 1918. During the period of greatest pressure, female civilian employees in the several hospitals laundered the linen used in the operating rooms, but despite their efforts and the utilization of all available resources, as many as 100,000 pieces were awaiting laundry at that time. An exchange was established in the warehouse where issues were

made against articles turned in and appropriate records kept, including numbers of all cars in which laundry was shipped.

The animal-drawn transportation at Allerey never assumed very large proportions, but several teams were kept in service until near the closure of the center. They were used chiefly to supply units inaccessible by auto trucks.

After the establishment of an auto park, the only other transportation which remained under the charge of the quartermaster were the shuttle railway freight cars, and the others which operated on the railway spur within the center. These latter cars were loaded at the warehouse and then drawn by truck, which moved on the road beside the track. It was soon found that more supplies could be delivered in this manner than by this truck alone and that this expedient released a number of vehicles that would have been necessary to move many small shipments. The quartermaster had supervision over this spur and the unloading of the cars bringing freight to the center.

Coincident with the construction work of the engineers, the quartermaster took over maintenance and the service of utilities. He effected repairs and operated cobbler, carpenter, and plumbing shops, the lighting plants, pumps, etc. So far as possible, maintenance was effected by the quartermasters of the several units, but communal service of this character was carried on by the group quartermaster, as well as that requiring large resources or technical skill not available in the units concerned.

Land was rented for a farm, to be cultivated by convalescent patients, and considerable work was done to prepare it for seeding; but it was never further developed by the center, which was closed before seeding was practicable. This farm, however, was employed to good advantage by the agriculture department of Beaune University when it took over the hospital center at Allerey.

The salvage service of the center was under the general supervision of the group quartermaster, but in fact was largely carried on in the several units. He consolidated their results. The articles receiving the greatest general attention were fats, burlap, paper, tin cans, bottles, bones, rubber, and wire. Fats collected in the several units were clarified by boiling and straining before shipment; burlap and paper were baled, and a few carloads of tin cans were shipped to salvage depots. Unsuccessful attempts were made to sell the remainder of them locally. Bottles were turned in for reissue or shipment if not needed in the center. Nails, wire, rubber, and bones were shipped to the depots designated. Salvage operations extended far beyond these simpler items, however, for all articles that could be employed to some alternative use or could be renovated were turned in for local repair or cleaned, and shipped to appropriate depots; e. g., instruments, appliances, clothing, ordnance, utensils, etc. Closely associated with salvage was prevention of waste, whether of comestibles or other supplies, especially dressings. Per capita wastage of foodstuffs, including liquids, was about 3 ounces per day, but this wastage was made to show some return through its sale to the contractors who removed garbage.

Another duty of the group quartermaster was the command of the labor battalion assigned to this center, the bakery and butchery companies, the field laundry detachment, details from the convalescent camp, civilian clerks, labor-

ers, and other employees in his department. Proper performance of this duty was difficult because of the wide dispersion of such personnel on different tasks, and could be met only by the detail of convalescent officers to supervise the work of the larger groups. One minor but constant duty in which the labor battalion was of especial service was that of unloading all railway cars within 12 hours and their notification, for removal, to the railway transport officer.

The cemetery for the center (A. E. F. Cemetery No. 84), was under the care of the quartermaster, in all that pertained to its physical care, such as preparation, filling, and marking of graves, provision of caskets and crosses, maintenance of roads, paths, shrubbery, etc. This office also kept a register of all burials and serial numbers of graves. In order that interments might be made with due reverence and with proper religious and military ceremonies, the first chaplain who arrived in the center was charged with making arrangements for all funerals. He also made the reports called for to the central records office and to the graves registration service, cared for all correspondence relative to interments, including the notification of relatives, and kept records of the name, rank, organization, religion, nearest relative, and cause of death and number of grave of each decedent. His records thus confirmed some of those of the quartermaster, but were more extended. He made appropriate notifications to other chaplains of the same faith as that of the deceased in order that they might officiate. Prior to the arrival of a chaplain of the Catholic faith, the parish priest at Verdun was requested to visit the center, to administer extreme unction and conduct funeral services for Catholic patients. If no chaplain of the same faith as the decedent (e. g., Jewish) was present, the services held by the officiating chaplain were as nearly as possible in harmony with those prescribed by his church. Remains were removed by ambulances. Firing squads, which attended all funerals, were detailed by the military police, and pallbearers were selected by the commanding officer of the hospital in which the patient died. Because of lack of lumber, it was at first necessary to mark graves by pegs instead of crosses. Each peg showed the notation later made on the cross which marked each grave, viz, name, rank, organization, and date of death of the deceased. To this peg, and later the cross, was fastened one of the decedent's identification tags, the other being buried with the remains.

A monument to the memory of Private Paul H. Burton, Base Hospital No. 25, the first soldier buried in the cemetery, was erected by the citizens of Allerey. A resident, whose château was located on the outskirts of that village, later offered to donate an elaborate monument to the cemetery, but as orders had been received in the interim that no monuments were to be erected, the offer was declined. A number of floral and other offerings were made by the French citizens of the neighborhood as well as by the occupants of the center.

MOTOR TRANSPORT

The motor transport service was charged with the procurement, maintenance, and operation of all motor vehicles assigned to the center, procurement of spare parts, provision of adequate transportation for all units, control of personnel assigned to this service, and preparation of appropriate reports, returns, etc. This service at Allerey was at first under the supervision of the

quartermaster, but in July, 1918, a separate department was organized by which all transportation belonging to the medical service of the center was pooled and repair shops operated. In the early period of occupancy no trucks were available for the service of hospitals, but needs were met to a degree by borrowing from the constructing engineer after 6 p. m., and at other times to meet emergencies. The motor park grew gradually and was placed on a much better footing after the arrival of Truck Company No. 554, with 72 men and adequate transportation. Truck and ambulance companies were formed, but service frequently was impaired by nonreceipt of spare parts or lack of gasoline. The automatic supply of 4,000 gallons per month authorized for the center proved quite inadequate and was increased from time to time until double the amount was being furnished. Much of this was used to operate pumps and the stationary engines, for lighting plants, etc. On several occasions, when grave difficulties arose because of nonreceipt of spare parts and of gasoline, it proved necessary to send trucks that could hardly be spared to Nevers and Dijon for enough of these to tide over an emergency. By November, however, shops were well equipped; the gasoline station had been established and these shortages had ceased; expert auto mechanics had been found among the personnel on duty in the center and in the convalescent camp and had been attached to the truck company. Usually not more than 1 vehicle of the 50 then in the center was in the shop at one time; rarely more than 2, though work was normally carried late into the night. Orders required that the drivers should not leave for the day until they had cleaned and oiled their vehicles, filled the gasoline tanks, performed necessary minor repairs, or reported these to the shop if unable to effect them themselves. One of the greatest handicaps to the motor service was the poor condition of the roads, which not only obstructed operation of vehicles but was responsible for many damages to them.

The three hospitals in the center which had been organized as American Red Cross units had each collected certain motor transportation in the United States, but these never reached their units in France, because of pooling and redistribution of motor equipment at base ports. The American Red Cross provided four Ford cars, which were put at the disposal of the several units by roster.

MEDICAL SUPPLY SERVICE

A depot for medical supplies was established at Allerey, as at other centers, for the following purposes: (1) To have on hand supplies to meet immediate needs, (2) to lessen fire risk at central depots, and (3) to facilitate shipments by enabling these to be made in bulk and when cars were available. To further reduce fire risk, storehouses were also established in all units in the centers.

The medical supply personnel at Allerey consisted at first of but 1 officer and 3 enlisted men, but this force was later augmented as need arose to 2 officers, 8 noncommissioned officers, and clerks and laborers as required. Valuable additions were officers and enlisted men who had seen service in larger depots. Duties were divided as follows:

Record section.—The sergeant in charge of the record section supervised all other personnel and had immediate custody of records, correspondence and reports, requisitions and returns of the depot.]

Receiving and storage section.—This section checked in all supplies, received and arranged in the storehouse those not issued to units direct from cars, and was in charge of the storehouse. Its personnel checked the unloading of all cars, whether unloaded into the storeroom or direct to units, and made record of contents of each car, with number of same.

Issuing section.—This section modified requisitions as needs required and made issues from the depot to units. It also received notations from the receiving section of such issues as it had made direct from cars. Such issues comprised chiefly beds, cots, bedding, and the supplies belonging to certain units which they had had shipped from the United States.

The first duty of the medical supply officer at Allerey was to inventory the considerable quantity of property already there when the center was organized and for which no packers' lists or invoices had been received. Supplies accumulated in the United States by the unit which first joined the center were not received until some two months after it arrived, so that meanwhile articles were drawn to meet its needs. An acute emergency which arose at the outset of the service at Allerey before all needed supplies had been received was met by securing supplies by truck from the depot at Is-sur-Tille instead of awaiting their arrival by train from the more distant depot at Cosnes, which normally supplied the center; also, by shipments from the American Red Cross depot at Dijon and by purchase in open market of some articles not obtainable from either of these sources. After this initial deficiency, supplies secured were, generally speaking, adequate, though sometimes very limited and in a few items, insufficient. Often, supplies sent from the depot at Cosne were from two to four weeks in transit, for one reason or another, such as an embargo. Hence, constant provision was required of all concerned and responsibility clearly fixed for any deficiency through lack of timely requisition. Whenever less than 10 days' supply of needed articles were on hand in a unit depot the fact was reported to the officer in charge of the center depot, who took appropriate measures to prevent shortages becoming deficiencies. Similarly this depot sought to keep a month's supply in stock. It had been planned to keep on hand supplies for 20,000 men for three months, but quantities for such reserves were not available at the depots.

As no separate storeroom had been provided for medical supplies, the quartermaster allotted half of his warehouse to that purpose. This was supplemented by the medical storehouses in all units which were kept filled to capacity, with the result that storage facilities proved adequate. Whenever possible, cars were unloaded at the unit needing their contents, so that much bulky property did not pass through the warehouse, being checked direct from the cars to the units. In October, on account of the sudden demand for beds because of the influenza epidemic and the Meuse-Argonne operation, each of the best-equipped hospitals in the center established a provisional hospital of 1,000 beds, for whose supplies the parent unit assumed accountability. In order to reduce paper work, these slenderly staffed provisional hospitals carried all property on memo. receipt, and issues made to them were taken up and accounted for by the parent unit.

The quantity of medical supplies reaching the center is indicated by the following figures:

Cars received-----	280	Sheets-----	65, 000
Beds-----	13, 000	Pillow cases-----	62, 000
Cots-----	7, 000	Hand towels-----	87, 000
Mattresses-----	15, 334	Cotton, pounds-----	33, 000
Blankets-----	100, 000	Gauze, yards-----	600, 000
Ether, 1/4-pound tins-----	32, 000		

RECEIVING AND EVACUATING OFFICER

The receiving and evacuating officer was responsible for the proper reception and distribution of patients and their evacuation as soon as their condition permitted, with proper records and equipment, to stations designated by higher authority. He received from the statistical officer daily abstracts showing the number of patients and empty beds in each hospital and in the convalescent camp, the number of officers and enlisted men ready for transfer to the camp and from the camp to depots. His office maintained graphic charts showing these data. Usually, but not always, the arrival of trains would be previously reported by telegram to the center by the regulating station at Is-sur-Tille, giving the number of the train, time of arrival, and number of medical and surgical cases. The receiving and evacuating officer then determined where these patients should be distributed, taking into consideration not only the number of empty beds in each hospital but also the respective facilities of each hospital. The most serious surgical cases including all litter surgical cases were sent to the hospitals which had first reached the center, as these were best equipped to handle them. Incoming patients with influenza were sent to one hospital; other infectious diseases, including venereal, to another, etc. Having decided upon numerical distribution so far as possible, the receiving officer made appropriate notification to the hospitals concerned and to the motor transport and sanitary officers. The receiving officer furnished details to remove patients and prepared for their reception, the motor transport officer furnished ambulances at the time and place specified, and the sanitary officer arranged for the cleaning and disinfection of trains and the police of the railroad spur. Triage was effected in the train by the receiving and evacuating officer, his assistant, the center officer of the day, and officers detailed from each hospital. This method delayed somewhat the cleaning of the train, but 600 cases could thus be classified and removed in three hours. During a certain period more than 2,000 patients a day were distributed in this manner, with a minimum of inconvenience both present and subsequent to all concerned. When necessary to release trains more promptly triage was expedited and effected in from one-half to three-quarters of an hour, but it was always found that this required some subsequent transfer of patients between hospitals. During the removal of contagious respiratory cases the hospital personnel discharging this duty wore masks.

The receiving and evacuating officer also supervised the activity of the disability boards in the several hospitals meeting with them frequently to assist in the classification of patients. When it appeared from daily morning reports that any hospital was not evacuating its patients as rapidly as it should—i. e.,

was allowing patients to remain an undue time on sick report—he visited its wards and, by personal examination of patients and service with its board, expedited their transfer to the convalescent camp.

These boards classified patients into four categories: A, fit for combat service; B, temporarily unfit for combat service but retained for early reclassification; C, permanently unfit for combat but fit for service in the rear; D, unfit for further service in France.

At first all patients of whatever class were evacuated direct from the several hospitals to the depots designated by higher authority, but later all except



FIG. 90.—Interior of receiving ward, Allerey hospital center

those in class D, and a few special cases, were evacuated only through the convalescent camp. Class D patients, including those seriously wounded who could be moved, psychiatric cases, etc., were evacuated directly from the several hospitals by special trains, which, on request of the center commander, were sent by the chief surgeon, A. E. F., from time to time for this purpose. Lists of these patients submitted by the several hospitals were consolidated and appropriate orders made when notice was received of the prospective arrival of a train. Each hospital evacuating class D patients was furnished a list with date, time, and place of entraining. It checked its patients into the train under the direction of the receiving and evacuating officer, and transmitted their completed records. Special cases requiring hospital treatment elsewhere—e. g., those requiring fitting with artificial eyes—were sent direct from the hospital in which they were being treated. They, like class B and D cases, were transported on ordinary passenger trains.

Patients were tentatively classified by their ward surgeons, then examined by the chief of service, and finally by the disability board of the hospital where they were undergoing treatment. Patients suitable for transfer to the convalescent camp were moved at a specified hour daily under a noncommissioned officer on order of the receiving and evacuating officer, who also notified the camp of the number to be expected from each hospital. With these men was sent a nominal roll, giving names, serial numbers, military status, age, race, religion, civil occupation, diagnosis in full, and classification, together with a certificate signed by the chief of service of the hospital whence they came, to the effect that they were free from vermin and infectious disease, were fully equipped and accompanied by complete records. All inmates of the convalescent camp were reexamined at frequent intervals, and when fit for transfer were paraded, their equipment was inspected, and those who did not feel fit for duty were ordered to fall out for reexamination. All these last-mentioned measures, including the preparation of proper orders, lists, etc., were in effect part of the evacuation service, but were performed under the commanding officer of the convalescent camp.

Several advantages were secured by evacuating all patients except class D and special patients through the camp. The most important of these were verification of patients' physical condition, frequent examination by trained physicians who specialized in this duty to determine progress, coordination, and verification of records, provision of a depot whence men could be drawn for needed service in the center while awaiting transfer, collective supervision by specialists of graded calisthenic exercises, and reestablishment of military discipline which may have been lost to a degree by patients while undergoing treatment in hospital.

Outgoing men had to be grouped according to destinations, for the several arms of the service had individual replacement depot or regulating stations to which class A patients were sent and, similarly, B and C patients were evacuated to designated points. It was found to be much simpler to evacuate one consolidated convoy than to notify all hospitals concerned and move a number of small detachments, the method that would have been necessary had evacuations taken place direct from hospitals and which had been practiced during the early days of the center.

Patients were transferred from unit to unit in the center as occasion required—e. g., transfer of infectious cases—by mutual arrangement between the respective commanding officers, and such transfers were then reported to headquarters of the center.

Arrangements for transportation of troops were made by the local railway transportation officer (on notification from the evacuating officer) who, in turn, made arrangements with the troop movement bureau headquarters, Services of Supply. It was sometimes difficult to get the reservations desired. Space allotted on local trains was often usurped by other organizations before they arrived at Allerey, and very frequently trains were many hours late. To diminish discomfort of men scheduled to leave during the night, they were transferred after the evening meal to quarters nearest the railroad station and not moved until the railway transport officer telephoned the near arrival of

the train. This measure, not available until overcrowding diminished, was important, for it saved many hundred patients the necessity of marching to the station, three-quarters of a mile distant, and then waiting through the night in cold and rain for transport, which occasionally did not arrive. Special trains, which were sometimes necessary, were available as a rule after three or four days' notice. Class B and C cases were evacuated on ordinary trains. Outgoing convoys, if their size warranted, were under charge of an officer. Sometimes several officers were detailed for this duty, as when, in one convoy, more than 1,200 men were transferred.

INSPECTOR

The duties of an inspector for the center never received undivided attention of an officer, for there was none available for this duty exclusively. To meet as well as possible a very evident need, the commanding officer directed the only other officer of the Regular Army who was present for any considerable period to assume these duties in addition to those of the commanding officer of Base Hospital No. 49. This hospital functioned so well that this officer was able to devote most of his time to inspections which took cognizance of both conditions within the center and its external relationships with French communities and individuals. He followed no routine, but inspected all elements of the command as need arose, recommending appropriate changes of method, transfers of personnel and equipment, investigated complaints, reported defects in service of units and individuals, etc. An important duty was the investigation and rectification, if just, of any complaint arising from misconduct of occupants of the center while on pass, and his activities in this field promoted amicable relations between the Americans and the French.

SANITARY INSPECTOR

The sanitary inspector supervised the sanitation of the center and was authorized to give orders on this subject. More specifically he was charged with making suitable arrangements for the disposal of excreta, waste, and refuse, disinfection of clothing, bedding, buildings, and hospital trains, supervision of measures ordered effected for the control of infectious diseases, inspection and report on the sanitation of units, coordination of the efforts of the sanitary officers of units, and report on progress of construction of buildings and grounds. Sanitary problems were numerous, and were intensified by overcrowding, shortage of equipment, and poor condition of roads.

The sanitary officer of the camp was assisted by the officers holding similar positions in the respective units. Also, in each unit there was a small, permanent detail of enlisted men engaged in sanitary work. At first, these enlisted men were selected from the units concerned; however, when sanitary squads No. 23 and No. 77 joined, personnel from these squads were distributed among the several units, thus permitting the release of the unit personnel. Members of the sanitary squads inspected and reported to the center sanitary officer upon all matters affecting sanitation therein; e. g., quantity and removal of garbage, collection and disposal of other refuse, ventilation, and water purification. Defects reported were corrected by the sanitary officers of the

center and of the unit concerned. Another section of the sanitary squads supervised general police duty, such as that of the railway spur, the cleansing and disinfection of hospital trains, operation of the center incinerator, and cleansing of the settling tanks of the sewer system.

The condition of buildings and grounds and of water, food, and clothing supplies of the center have been discussed above under the construction and the quartermaster service, respectively. No further reference need be made to these subjects here, except that milk was purchased from neighboring dairies, but it was so heavily contaminated that local orders required its Pasteurization before use.

Garbage was removed under contract twice a day by a nearby farmer who, under supervision, performed this service very satisfactorily.

The pail latrine system was employed. As to the final disposal of excreta, this was buried in a pit north of the center, until an extemporized incinerator was built of salvaged material. The pails were emptied into covered barrels which were hauled by truck to this point. Unsatisfactory as was this method, it had to be employed from time to time until toward the close of the center. No excavator wagon was obtainable. Five Horsfall incinerators were received from time to time, but these proved quite inadequate for the needs of the maximum population in the center, so that recourse was had, with satisfactory results, to the use of the center incinerator. Pits were dug to collect urine and waste water, but because of the impermeable soil these soon filled and their contents were removed in barrels to a disposal tank on the outskirts of center. Eventually these fluids were removed largely through the sewer, though by the end of October, 1918, not more than half of the sewerage system had been completed. Urine pits were never connected with the sewer, but their contents were pumped into it by hand pumps.

Disinfection was effected at first in Serbian barrels, but later four portable disinfectors, American type, were installed from time to time. These, together with a Canadian hot-air disinfecter built in the convalescent camp, met most needs, but during periods of stress were supplemented by the Serbian barrels until toward the end of the center's existence. The portable appliances were distributed, and their use by neighboring units regulated, according to roster. Mess utensils were disinfected after each meal by immersion in boiling soapy water and boiling clean water successively.

The sanitary officer inspected all parts of the camp at least twice monthly and daily any part of it which required especial attention (e. g., wards for infectious diseases). He kept a blue print of the camp, marked each day with colored pins, which indicated the location and character of sanitary defects reported by the sanitary squads or the sanitary officers of units, or discovered on his inspections. He graded on a percentage basis the sanitary condition of wards, kitchens, latrines, food wastage, and general police of the several units. These gradings of all units, published twice a month to the command, proved a stimulus to amiable rivalry.

An important duty of the sanitary officer was the enforcement of orders for the control of infectious diseases. Such orders, in so far as professional measures

were concerned, were initiated by the chiefs of the medical and laboratory services; methods of their application were determined by the sanitary officer in conjunction with them.

The sanitary officer kept up graphic charts showing the number of cases of each infectious disease in the center. The occurrence of each case of diphtheria, meningitis, mumps, and measles in each building in the center was shown on a diagram of the center, by the appropriate insertion of pins with differently colored heads—one color for each disease.

In November, 1918, the center at Allerey was housing over 22,000 in addition to about 600 troops and employees of the engineers and was severely



FIG. 91.—Delousing apparatus, Allerey hospital center

overcrowded. A number of cases of influenza and pneumonia had been received during October, together with many gassed cases who were very susceptible to respiratory infections. The greatest number of influenza cases was 1,002 on November 4, when the total number of patients in the center was 16,063; and the greatest number of pneumonia cases, 291, was reached four days later. By January 1, 1919, the number of cases of each of these infections had fallen to 100 and 51, respectively. Influenza and pneumonia cases developing in the center were transferred so far as practicable to appropriate wards in the same hospital in which they arose, but all other infectious cases were transferred to appropriate wards in Base Hospital No. 56. Though other infectious diseases—diphtheria, cerebrospinal meningitis, mumps, measles, German measles, erysipelas, typhoid, paratyphoid, and scarlet fevers—were introduced into the center,

only diphtheria occurred in any alarming number. It had been introduced by chronic carriers, especially those who had been gassed, these latter being highly susceptible to the disease. The number of cases rose gradually to 95, on December 2, the most important factors in its spread being overcrowding, contaminating hands, and fomites (indirect droplet infection), and, at first, delayed diagnosis in laryngeal cases. Clinically these cases often were very similar to membranous laryngitis caused by "mustard" gas. Measures for control adopted were:

(1) Inspection of all throats daily and prompt segregation of positive cases, carriers, and suspects. These were transferred to cubicled wards and wore masks when out of their cubicles.



FIG. 92.—Clothing preparatory to delousing process, Allerey hospital center

(2) Quarantine of wards in which a case developed until the throats of all therein were cultured, inmates meanwhile wearing masks.

(3) Contacts, including those occupying, or working in, the same building were given the Shick test, and if this proved positive they were given antitoxin.

(4) Carriers and contacts were quarantined until two negative cultures were obtained, at 48-hour intervals, from the nose and throat.

When five or less positive atypical cases were found in a ward when a case of diphtheria had appeared, they were sent to the quarantine wards in Base Hospital No. 56; when more than that number were found in a ward, the ward was quarantined. The throats of all its inmates were treated for 3 days and, after 24 hours' respite, were recultured. Quarantine, though rigorous, was made as brief as possible, in order to insure cooperation of those affected by it.

Similarly, meningococcus carriers were quarantined until after two negative cultures were obtained at one-week intervals. Eighteen cases of this disease developed, between no two of which could close contact be established. Ten cases appeared at the time of greatest crowding, but epidemic developed.

Observation wards were provided in each unit for the segregation of suspected cases of infectious disease. All these beds, as well as in the contagious wards, were cubicled and attendants were masked. The sanitary officer in each hospital made frequent day and night inspections of the wards for contagious cases, and exemplary punishments were inflicted for violation of quarantine. Proper ventilation and head-to-foot sleeping arrangements were enforced.

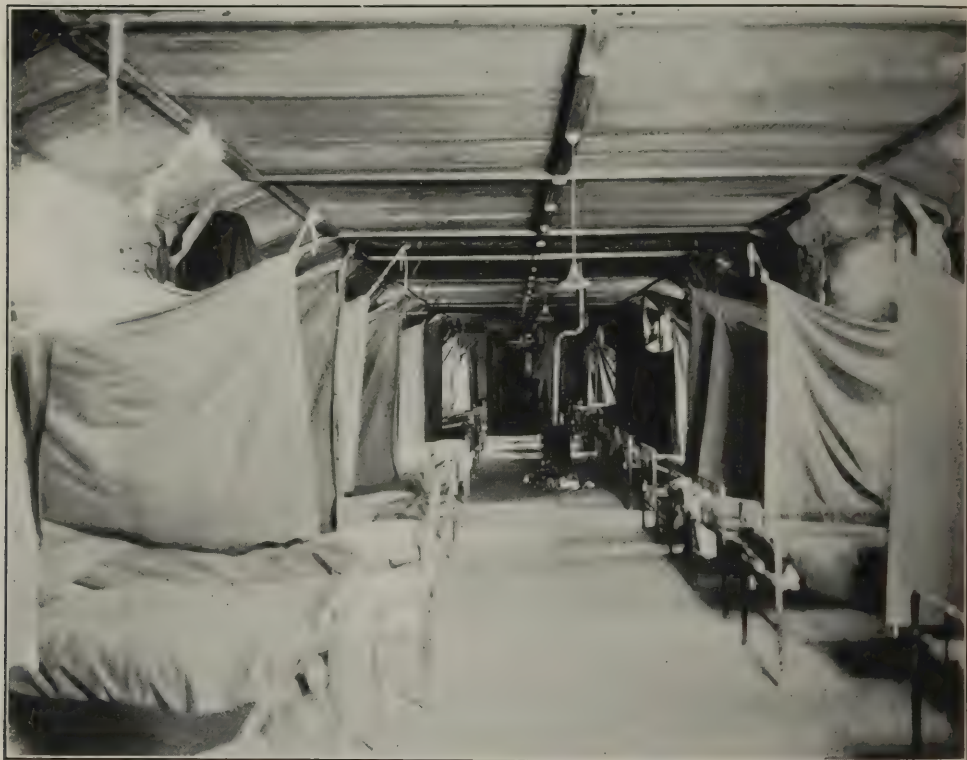


FIG. 93.—Interior of one of the quarters for enlisted men, Allerey hospital center

Public gatherings were forbidden for a few weeks during the height of the influenza epidemic.

Buildings were heated by coal and wood stoves, but a sufficiency of these to make all structures comfortable never was received. Proper heating of tents was especially difficult.

French shower baths, provided in adequate number, proved very satisfactory. Personnel and ambulant patients were required to bathe twice weekly at least, and permitted to do so more frequently if they did not interfere with the use of these baths by roster.

Very few venereal cases developed. Preventive measures were those usually employed.

FIRE MARSHAL

The fact that the housing facilities in the center were constructed entirely of pine or were canvas caused the fire hazards to be exceptionally great, though these were minimized as far as possible by the spacing of units and tents and by the installation of spark arrestors on all smokestacks or chimneys.

The fire marshal of the center was charged with the formulation of fire regulations, procurement and distribution of fire-fighting material, instruction of the fire marshals and squads of the several units, supervision of their drills, inspection of apparatus at least twice monthly, etc. The fire marshal being also sanitary officer, he added the duties of firemen to those of the sanitary squads



FIG. 94.—Heating apparatus for patients' baths, Allerey hospital center

and required that, when making sanitary inspections, the members of these squads were to note the condition of buildings and grounds and of fire-fighting apparatus. Such apparatus was rather delayed on delivery. When received, much of it was placed in those units treating the greatest number of bed patients and the remainder as equitably as might be throughout the center. At first the only facilities were fire buckets (which were used for no other purpose), 45 fire barrels, and 2 hand pumps to each unit. Eventually all units were equipped with Pyrene and Hardin extinguishers, 10 pumps of 5-gallon capacity, and 640 feet of 2-inch hose. A central fire department, consisting of 12 men on day and night duty who were in charge of a 90-gallon chemical fire engine, was soon expanded to operate three other such engines, which were distributed through the center. Detailed regulations covering fire service were posted in all wards, barracks, etc., and fire drills in accordance therewith were held weekly in each

unit and by the fire department of the center. Notwithstanding all precautions a number of small fires occurred, of which about 90 per cent were attributed to cigarette stubs; the only one that was at all serious was caused by an explosion of a small gasoline tank. Because of the danger of fire to the bed patients and the grave effects of the loss of even one structure in so crowded a community, smoking in wards and barracks was forbidden until the number of bed patients and the population of the center were considerably diminished and fire apparatus fully installed. The gravity and imminence of the fire menace is attested by the fact that within two hours after the premises were turned over to the French, four buildings were burned and the conflagration arrested only with considerable difficulty.

SIGNAL SERVICE

During the early history of Allerey, the French telegraph line was the only one available. An interpreter in the engineer's office was the connecting link, receiving and delivering by telephone, through the French office at the railroad station, messages pertaining to the center; but this service was very unsatisfactory as messages were often garbled in transmission. Exterior telephone service was soon extended to Dijon, but connections were difficult to get, and these usually were cut before a conversation was completed. It was not until after the center was linked up with the American lines that exterior service was reliable. At first no telephones were provided for interior communication, a circumstance which both slowed up service and necessitated the use of runners who could ill be spared from other duties, but these instruments were gradually installed, until by October, 1918, 46 were in operation. At that time a detachment of the Signal Corps joined and began operating a central office, which soon handled the following average business daily: Telephone calls, internal, to the center, 425; outgoing, long distance, 25; incoming long distance, 36. Telegrams received (2,950 words), 60; telegrams sent (3,400 words), 75. In addition to the foregoing were the internal calls (of whose number no record was kept) to the several units which had separate systems of local calls.

ENGINEER OFFICER

Throughout the occupancy of the center, the constructing engineers continued to be engaged in the completion of the project, but were also concerned to a degree with the solution of engineering problems which arose in sections already occupied; e. g., settling of water mains, upkeep of roads, etc. As this constructing force was to be withdrawn, however, as soon as the center was completed, and as no provision was definitely made for the assignment to the center of an engineer to solve problems that might later arise in this field of work, an officer of engineers in the convalescent camp was assigned to duty at headquarters to acquaint himself in detail with the problems which the constructing force had encountered and how they had been overcome. It was proposed to have him detailed as the engineer officer of the center when the constructing force was withdrawn, but this never proved necessary as the constructing force remained until the center closed.

ASSISTANT JUDGE ADVOCATE

The duties of an assistant judge advocate were discharged by the adjutant in addition to his other services. These comprised examination and, if need be, the correction of charges and findings, details of special courts, etc. General courts-martial for the center were detailed by the commanding general, Services of Supply.

ASSISTANT PROVOST MARSHAL AND COMMANDANT OF GUARD

When the first unit arrived at Allerey, the only guard provided was a detachment of 10 men of Company F, 162d Infantry, engaged in protecting property of the engineers. This nucleus was gradually augmented, partly from outside sources, partly by details from the convalescent camp. But few firearms were available for several months, a circumstance which made it necessary to arm with clubs the interior guards and some of the personnel at posts outside the center. French gendarmes were too few to effectively restrict the American soldiers or to enforce the laws controlling sale of alcoholic stimulants. The police and guard services grew with the center's development, and by September there were 10 military police posts which covered 6 adjoining towns and adjacent territory. These were under the command of the assistant provost marshal detailed by headquarters of the Services of Supply. This officer was responsible for the discipline, records, etc., of the military police quartered in the center, reports of their activities, establishment of an adequate number of police posts throughout adjoining territory, protection of inhabitants against disorders and depredations by American troops, supervision of travel by military personnel, arrest and detention of all stragglers, absentees without leave, and other violators of the laws and orders whether of French or American origin, to which Americans were subject. At first the assistant provost marshal also commanded the interior guard, but this organization later was separated entirely and placed under the command of a line officer detailed from patients in the convalescent camp. At this time the guard consisted of 3 platoons, each having 3 sergeants, 12 corporals, and 79 privates, each platoon being commanded by a commissioned officer. Almost all this personnel was drawn from the convalescent camp and, under existing orders, had to be returned to duty as soon as fit, a circumstance which required the return of its members about as soon as they were trained, and enhanced greatly the difficulty of this service. In August, Provisional Company No. 6 and Provisional Company No. 20, each comprising 100 class B men, were assigned to the center for guard duty. An efficient military police who, as distinguished from the guard, functioned outside the camp was necessitated by infractions of law on the part of some of the local French population. The most serious of these offenses were illegal sale of alcoholic stimulants and the purchase of Government property, such as military clothing and blankets. These offenses were controlled only by numerous arrests, search warrants, and prosecutions in the French courts. Clandestine sales of liquors in camp by employees and by laborers were suppressed by similar means. Absences without leave were controlled by demanding passes of all men encountered by the police outside

of camp, and by sentencing men found guilty to unpleasant duty, as with the labor battalions. One motor cycle was employed by the military police for the apprehension of such delinquents. By means of this vehicle the police reached points where it was impractical to post guards, and the radius and intensity of their control were notably increased.

INTELLIGENCE OFFICER

The intelligence officer for the center was assisted by others occupying comparable positions in all units, by officers censoring mail, the post-office force, the telephone and telegraph operatives, etc., so that very complete information reached headquarters of the conduct and loyalty of individuals and of morale throughout the center. This service was important, for it was an additional means of determining the needs of personnel and how they might best be met. Derelictions discovered through it were met in other ways than by court-martial, for none were grave enough to warrant this, and could be handled better by administrative than by juridical methods.

CHAPLAIN

As the center expanded, the number of chaplains present, 4 Catholic and 4 non-Catholic, proved inadequate without some organization, to the many needs arising for their service. The senior chaplain present therefore was placed in general supervision of the chaplains' activities and in charge of the center chapel. His functions in these capacities were to make suitable provision for all those seeking the services of ministers of their faith and to prepare a roster for the use of the chapel by all ministers in turn. Thus such needs throughout the center were coordinated. As chaplains made their visits through wards and elsewhere, they learned the names of those of other faiths who desired the services for chaplain and promptly took appropriate measures to secure these services. Each chaplain normally served those of his faith, not only in his own unit but in others as well.

In addition to the services in the chapel, others were held in the several units in the recreation halls and, when these were filled at one time by beds, in dining rooms. Dining rooms were by no means suitable for the purpose, but the fact that any other arrangement was temporarily impossible was recognized by ministers and congregations alike, and services were conducted with normal decorum and success. As noted above, suitable provision for interments was made by the interment officer, who was the first chaplain to come to the center.

From time to time the chaplains met informally to discuss questions pertaining to divine services and social needs, for they charged themselves with the performance of whatever duty they could discharge which came to hand. These duties included the promotion of entertainment within the several units, in conjunction with the American Red Cross, the organization of orchestras, glee clubs, etc., preparation for Thanksgiving and Christmas celebrations, writing letters for disabled or uneducated men, and, by sympathetic helpful interest, promotion of the happiness of such as sought their aid, or when they

proved in need of help or encouragement. Their counsel was constantly being sought by patients and duty personnel alike in matters affecting their secular welfare.

RAILWAY TRANSPORTATION

The railway transportation officer was responsible for the transportation by rail of personnel and supplies to and from the center, except movement of hospital trains and supervision of the railway spur, the former being under the orders of the regulating station at Is-sur-Tille and the latter under the center quartermaster. Upon notification of the number of patients fit for transfer, and their destination, he made appropriate request on the troop movement bureau at Tours and notified the evacuation officer when transportation was made available. He traced lost freight, notified the center headquarters of the time of arrival of hospital trains, arranged for the movement of the shuttle railway car back and forth to Dijon, and maintained liaison with the fourth bureau of the French War Department. His office in the railway station was connected by telephone with the hospital center and maintained day and night service, with the result that local business was handled promptly, and, by means of long-distance telephone calls, hour of arrival of trains for outgoing drafts was notified to the center in due time for them to be moved without tedious waiting, yet without delay.

AMERICAN RED CROSS

Shortly after the hospital center at Allerey was organized, an officer of the American Red Cross joined the headquarters staff and remained in charge of Red Cross activities until the center neared its close. His department grew until it consisted of 3 officers, 23 workers, 2 searchers, and a variable number of civilian employees. He exercised general supervision over his department, obtained and distributed needed Red Cross supplies, and coordinated efforts of his department personnel; one of his assistants arranged for entertainments to be given in the center from extraneous sources, procured moving-picture apparatus, films, etc., and another, as a field inspector, determined needs of patients, efficiency of workers, etc. The workers, distributed among the units, met incoming hospital trains to serve hot chocolate and coffee and to distribute cigarettes. They assisted patients in many ways throughout their stay in hospitals, as by the donation of tobacco, confectionery, stationery, etc., resale at cost of supplies purchased from the commissary, writing of letters, etc. Among the gifts distributed by the Red Cross prior to January 1, 1919, were 35,000 comfort kits, 375 cases of bar chocolate, 50,000 pairs of socks, 35,000 sweaters, 5,000 cases of cigarettes and tobacco, 100 cases of chewing gum; at Christmas, 1918, 15,000 pairs of socks were filled and distributed. Part of the contents of these were 200 sacks of nuts and confectionery made from 15 tons of sugar. The Red Cross also met the graver needs of patients, its depot supplying many articles required for their care and comfort, especially in emergencies when there was not time to get them from Army depots. Thus, to meet the needs occasioned by the Meuse-Argonne operation and when shipments from the medical supply depot at Cosne were held up by embargo,

the local chief of the American Red Cross procured from the depot of that society in Paris 10,000 blankets, 10,000 sheets, 1,000 operating gowns, 1,000 helmets, 1,000 pairs of bed socks, 600 suits of pajamas, 2,000 yards Carrel tubing, and 2 cars of surgical dressings. The promptitude with which these essential articles were received at this time undoubtedly saved a considerable number of lives. These articles were shipped by freight cars attached to the Paris-Marseille express to a point near the hospital center, whence they were transported to the center by truck.

On the one hand, the searchers located relatives and friends at home, of patients in hospital, and, on the other, for interested ones at home, men who had been lost in the American Expeditionary Forces. One of their duties was the detailed report of the American prisoners of war who reached the camp from Switzerland and to assist these men in straightening out their affairs.

The several hospital units of the center provided to a degree their own entertainment, such as dances, theatrical performances, and concerts, but to the local American Red Cross fell the duty of promoting entertainment generally, obtaining troupes, films, etc., from outside sources, and coordinating resources among the organizations. Each hospital unit had a recreation hut accommodating 600 persons; the convalescent camp had a hut accommodating 1,500. All of these buildings were donated by the American Red Cross. That society installed 10 pianos in these buildings and furnished instruments for a band, three orchestras, and a fife, drum, and bugle corps. From the middle of October, 1918, until November 25, the recreation huts in most units were filled with beds, but as rapidly as these were cleared performances were staged, and when, in December, sufficient electric current became available moving pictures were exhibited. These were shown five nights a week in each unit, and from one to three of the American Expeditionary Forces traveling shows played nightly in the center.

About January 15, 1919, a nurses' recreation hut was opened by the American Red Cross, providing reading, writing, and lounge rooms. Tea was served here each afternoon and a dance given every evening except Sundays, the chief nurses of the hospitals acting as hostesses by roster. In the same month the Red Cross opened in Chalons-sur-Saone, the nearest large town, a centrally located building which provided a recreation and writing room for enlisted men, separate sitting rooms for officers and nurses, and a common drawing room where tea was served by the Red Cross worker in charge.

A library of 500 books was maintained in each unit and large numbers of current American, English, and French periodicals, especially those carrying illustrations pertaining to current events, were distributed.

In the headquarters building, the Red Cross operated a bank and an information bureau. The bank made loans and cashed checks, the amount of its business amounting to over 785,000 francs. The information bureau assisted some 300 men daily.

CONSULTANTS IN THE PROFESSIONAL SERVICES

The consultants of the several professional branches supervised the activities of their respective specialties throughout the center, in addition to performing the duties of chief of service in the hospitals to which they were assigned.

They were charged with the study of pertinent professional needs and available resources, in personnel and material, recommending transfers as required to the best advantage. They acquainted themselves with the qualifications of their own resources as far as possible, but reported to the commanding officer those matters needing his cooperation, acquainted themselves with new methods of treatment, and disseminated professional information. This last important duty was effected in several ways, such as by conferences attended by all officers in the center belonging to a given service, by personal discussion with individuals concerning treatment of a particular case or group of cases, and by presentation of cases or papers read at meetings of the medical society. In order to afford a clearing house for professional knowledge, the "clinico-pathological society" was organized, to meet twice weekly. At one of these weekly meetings unusual cases were presented and discussed; at the other, reports of autopsy findings and demonstrations were made. It had been noted early that certain clinical diagnoses had proved difficult, such as certain cases of laryngeal diphtheria, complicating injury caused by inhalation of "mustard" gas, pericarditis, and empyema, and cases selected for presentation were those that had presented difficulties in diagnosis and treatment. Similarly, difficult surgical cases were presented and discussed. By such means there was promptly disseminated much information of a highly technical character, which was of immediate value, especially to medical officers who had newly arrived overseas and had not yet had practical experience in treatment of certain newly encountered conditions. By the report of autopsy findings, an error in diagnosis or treatment by any medical officer was immediately made known to the chief of service so that appropriate action could be taken. Frequently, the respective staffs of the several hospitals met to discuss professional matters internal to the units. A number of papers were written, and later published, on professional activities in the center. It had been planned that each service eventually would organize its professional society, but because of shortage of personnel and pressure of duties, this project could not be effected.

Through the visits of the consultants from ward to ward, and the discussions in the medical society and out of it, a standardization and coordination of service was effected. Though certain professional measures were mandatory, for example, those for the control of diphtheria, medical officers were encouraged to feel that they had an active part in the development of professional methods, and they formulated the few orders published concerning professional activities.

To meet the fluctuating needs in the nursing service in different parts of the center, the senior chief nurse, in addition to her other duties, made frequent surveys to determine what transfers of nurses should be effected between hospitals and to make recommendations concerning their activities and welfare. Similarly, the senior dietitian made surveys concerning dietaries, the preparation and service of foods, recommended transfers of dietitians with the different hospitals, and gave assistance in her specialty wherever this appeared advisable.

COLLECTIVE ACTIVITIES OF HOSPITAL UNITS

It is the purpose of this chapter to consider collective, rather than individual, activities of the hospitals of which the center at Allerey was composed, the individual activities were comparable to those of detached base hospitals. Certain notations regarding each unit composing the center are made, however, to show how each fitted into the general plan.

The following hospitals joined the center in sequence: Base Hospital No. 26, comprising personnel from the University of Minnesota, the Mayo clinic, and the medical profession of Minnesota at large, had been joined in the United States by 12 officers and 50 enlisted men from Baylor University, Texas. This hospital joined June 20, 1918, with 36 officers, 65 nurses, 1 dietitian, 2 technicians, 3 stenographers, and 207 enlisted men. Base Hospital No. 25, comprising personnel from the Cincinnati Medical College, and the medical profession of Ohio at large, joined July 15, with 41 officers, 100 nurses, 1 dietitian, 2 technicians, 3 stenographers, and 208 enlisted men. Base Hospital No. 49, with 38 officers, 100 nurses, 1 dietitian, 2 technicians, 2 stenographers, and 208 enlisted men, from the University of Nebraska and the medical profession of that State at large, joined August 5, 1918. Evacuation Hospital No. 19, with 33 officers, 100 nurses, and 237 enlisted men, organized at Fort Riley, Kans., joined September 19. Base Hospital No. 70, with 40 officers, 100 nurses, and 200 enlisted men, organized at Fort Riley, Kans., joined September 28. Base Hospital No. 56, with 30 officers, 99 nurses, and 188 enlisted men, organized at Fort Oglethorpe, Ga., joined September 30. Base Hospital No. 97, with 31 officers, 2 dietitians, 192 enlisted men, organized at El Paso, Tex., joined November 30. It was joined on December 14 by 97 nurses. Base Hospital No. 82 joined September 19, but on September 21 it was transferred to Toul.

In conformity with the urgent demand for increased hospitalization in the American Expeditionary Forces, the first five hospitals which reached the center each organized a provisional hospital consisting of from 7 to 12 officers and about 40 enlisted men. Each of these provisional units took over an unoccupied, uncompleted section of the center and undertook to care for 1,000 patients whose condition was not severe but who were not ready for transfer to the convalescent camp. The senior unit relieved its respective provisional hospital of as much as possible of administrative work—e. g., reports of sick and wounded, returns for property (except clothing and ordnance)—but, generally speaking, these junior units were autonomous.

The convalescent camp was organized June 26, 1918, from personnel on duty at Allerey and by limited casual personnel assigned to the center for that purpose.

The personnel of the three American Red Cross hospital units which had been the first hospitals to join had been selected from large resources so that their commissioned staffs were composed of men well trained in their several specialties, whether surgery, medicine, laboratory, or dental, and who were mutually acquainted with the professional methods of others in their units. Nurses, dietitians, technicians, and enlisted men comprising college men, professional cooks, technical draftsmen, also had been selected from

among many who were eligible. Thus each of these units was well balanced. This balance, however, was considerably disturbed by the need of supplying personnel to form the headquarters organization, organize provisional hospitals, provide surgical teams which were sent to the front, and to meet other needs. The other hospitals which composed the center contained many very capable officers, nurses, and men, but in comparison with the Red Cross units they were handicapped by the lack of prior mutual acquaintance; also, they were handicapped in their earlier professional efforts by the necessity for concentrating, as described below, a considerable part of the limited equipment available in the hospitals which first arrived in order that the most serious cases could receive suitable care.



FIG. 95.—An operating room, Allerey hospital center

Each of the Red Cross hospital units had accumulated medical property to the value of from \$30,000 to \$100,000 in the United States. But since the property was not received until about two months after they reported at Allerey, it was necessary to completely equip them, even at the expense of other units, so that they could care for all types of cases, and for this reason they were at first given preferential consideration in the distribution of equipment. This procedure made it possible to treat satisfactorily all classes of cases who could not have been so well cared for had equipment been scattered. Later, as resources developed, other hospitals were equipped to greater or less degree, especially in their laboratories, operating, and X-ray departments.

This distribution of equipment had a corresponding influence on distribution of patients. Thus, grave surgical cases were concentrated at first in Base Hospitals Nos. 25, 26, and 49; psychiatric in Base Hospital No. 25; neuropsychiatric in Base Hospital No. 49; infectious diseases (other than influenza and pneumonia), complicated venereal and dermatological diseases in Base Hospital No. 56; ophthalmic in Base Hospital No. 26; otolaryngological in Base Hospital No. 49; influenza and pneumonia in Base Hospitals Nos. 25, 26, 49, and 70; complicated dental cases in Base Hospital No. 26, etc. Since many cases admitted were suffering from two or more conditions a sorting of them was effected in such a manner as to give the graver condition preferential



FIG. 96.—Sterilization room, Allerey hospital center

consideration. The most serious cases of this class were the severely wounded who had contracted pneumonia. The provisional hospitals cared for patients not ready for transfer to the convalescent camp.

All hospital units of the center had their medical and surgical cases in wards devoted as far as might be to the treatment of one class of patients only. Thus wards were established for patients with infected wounds, fractures, and dislocations, clean surgical cases, surgery of the head, face, nose, throat, dental cases, gassed cases, cases of pneumonia, influenza, etc. Each hospital established a cubicled observation ward, to which was transferred each suspected case of contagious disease, until diagnosis was established, when it was properly assigned. A nurses' ward for the service of the entire center was established in Base

Hospital No. 49. The infectious cases grouped in Base Hospital No. 56 were segregated, as far as possible, though because of the great overcrowding of the center and limited personnel and equipment, it was not possible to provide a separate ward for each type of disease. At the period of greatest overcrowding in the center, wards built for 50 patients were sheltering 70; however, the wards for infectious cases were made to house but 48 inmates each.

Consequent upon this segregation of cases was the local development of several departments in certain hospitals; e. g., an occupational work shop for psychoneurotic cases in Base Hospital No. 25, orthopedic shops in Base Hospitals Nos. 25, 26, and 49, and the especial equipment of hospitals which were carrying on special activities. A central orthopedic workshop was never established. The plan had manifest advantages, but at Allerey shops were operated



FIG. 97.—A surgical ward, Allerey hospital center

in several hospitals in order that orthopedic appliances might be made under the immediate supervision of the respective surgeons, who could ill afford the time necessary to go to a central workshop for this purpose.

Except that certain departments were more developed in some hospitals than in others and that personnel was depleted for various reasons, the organization of each hospital conformed to the general plan formulated by the War Department for these institutions. The detail of from 1 to 6 surgical teams from each unit, except Base Hospital No. 97, took from the center, from time to time, much of its best operating personnel for from a few days to several months. These teams usually consisted of 2 medical officers, 3 nurses, and 2 enlisted men.

The total number of cases admitted was 33,658, distributed as follows: Base Hospital No. 26, 5,512; Base Hospital No. 25, 5,860; Base Hospital No.

49, 4,626; Base Hospital No. 56, 7,338; Base Hospital No. 70, 5,371; Evacuation Hospital No. 19, 4,951. Base Hospital No. 97 received convalescents from other units.

The following summary of medical cases treated in Base Hospital No. 25 prior to January 1, 1919, indicates the general scope of the medical activities of the center:

Disease	Cases	Deaths	Disease	Cases	Deaths
Pneumonia and empyema	248	74	Typhoid fever	5	
Influenza and bronchitis	859		Paratyphoid fever	1	
Diphtheria	42	1	Pulmonary tuberculosis	9	
Diphtheria carriers	97		Malaria	3	
Measles	4		Dysentery and other diarrheas	261	
German measles	1		Nephritis	10	3
Mumps	3		Psychoneurosis	575	
Scarlet fever	2		Cardiovascular	17	
Erysipelas	6		Tonsillitis	52	
Epidemic meningitis	2		Arthritis	70	
Meningitis carriers	3		Miscellaneous	29	
Gas cases	741				



FIG. 98.—A psychiatric ward, Allerey hospital center

Similarly, the range of surgical activities is indicated by the following list of operations in Base Hospital No. 49:

Amputations	12	Hemorrhoidectomies	22
Aneurysms	3	Herniotomies	12
Appendectomies	17	Laminectomies	2
Aspirations	1	Skin draft	1
Circumcisions	4	Thoracotomies	1
Closures	305	Tracheotomies	2
Colostomies	2	Tubercular glands	1
Débridements	13	Venectomies	2
Decompressions	3		
Drainages	75		
Foreign bodies	27	Total	506

The greatest number of surgical operations was performed in Base Hospital No. 26, where, 1,021 operations were performed in the operating room.

In the treatment of surgical cases, certain hospitals of the center required, in order, the débridement of wounds if this had not already been done, the culturing of all deep wounds, preparation of smears from all wounds, treatment of all wounds by Dakinization, and secondary closure after three clean smears had been obtained, the last of which had preceded operation 24 hours.

In the center otolaryngological clinic, the following cases were treated and operations were performed from the date of organization (August 20, 1918) to January 8, 1919:



FIG. 99.—Eye and ear clinic in one of the hospitals, Allerey hospital center

New cases seen in clinic	1, 026
Old cases seen in clinic	1, 023
	2, 049
Consultations by ear, nose, and throat department in other hospitals in center	645
Operations:	
Tonsillectomy	85
Mastoidectomy	49

Operations—Continued.	
Submucous resection nasal septum	47
Antrum of Highmore	13
Frontal sinus	14
Ethmoid	12
Sphenoid	2
Closure	3
Miscellaneous	25
Total	250

Deaths in the center totaled 429, including several deaths by accident, such as drowning or railway accident, giving a mortality of 1.27 per cent. Seventy-

four and two-tenths per cent of the deaths were from disease, 24.8 per cent from surgical causes, but an exact differentiation is difficult for the reason that though 40 per cent of the deaths among wounded were returned as due to intercurrent disease, chiefly pneumonia, in certain of these cases the impaired vitality caused by the wound was a contributing factor. The highest death rate was during October, when 245 deaths occurred, the majority being due to respiratory diseases. It was during this month that influenza and pneumonia were at their height. Pneumonia was present in 61.2 per cent of the 356 cases which came to autopsy, bronchopneumonia constituting three-fourths of such cases.

LABORATORY SERVICE

In addition to the unit laboratories, provided for the several hospitals, a more fully equipped laboratory was operated for the entire command under the center laboratory officer. The distribution of duties between the unit and center laboratories was prescribed by the director of laboratories and infectious diseases, A. E. F. In general terms, the duties of the unit laboratories included routine urine analyses, blood counts, examinations of sputa and stools, media making, wound bacteriology, preparation of Dakin's solution, and grouping of blood for transfusions. For November, 1918, when the center was at its maximum, the following figures were reported from five of the hospitals in the center:

	Hospital laboratory				
	No. 25	No. 26	No. 56	No. 70	No. 19
Red cell count.....	23	20	15	7	16
White cell count.....	47	97	54	40	52
Differential count.....	40	35	48	30	5
Lime (quantitative).....	253	396	181	141	114
Feces examination.....	25	95	9	8	2
Sputum examination.....	68	135	34	52	14
Bacteriological examination.....	1,257	1,228	346	270	399
Wound smears.....	73	324	333	320	123
Miscellaneous.....	1,115	445	109	514	257
Total.....	2,901	2,773	1,129	1,382	874

Total examinations, 9,059.

For the period prior to January 1, 1919, the following are the figures for the more important laboratory examinations made at Base Hospital No. 49:

Aerobic wound cultures (1,529 wounds).....	3, 198
Wound smears.....	3, 198
Anaerobic wound cultures.....	210
Sputum examination for tuberculosis.....	213
Number positive to tuberculosis.....	5
Urinalysis (chemical and microscopical).....	1, 468
Bloods grouped for transfusion.....	30
Throat cultures for diphtheria made in unit laboratory and examined in central laboratory.....	4, 116
Schick tests.....	747
Smears for Vicent's organisms.....	121
White blood counts.....	214
Red blood counts.....	29
Differential blood counts.....	63

The following statistical list shows some of the more important work performed by the center laboratory up to January 1, 1919:

Autopsies.....	356
Spinal fluids:	
Smears for meningococci.....	37
Colloidal gold.....	27
Dark field examinations for <i>treponema pallida</i>	15
Positives.....	3
Stools for typhoid and dysentery.....	157
Positive typhoid.....	5
Positive dysentery.....	0
Pneumococcus typing, Avery.....	90



FIG. 100.—Center medical laboratory, Allerey hospital center

Throat cultures for diphtheria.....	23, 726
Pharyngeal cultures for meningitis.....	1, 293
Positives.....	34
Throat cultures for hemolytic streptococci.....	871
Wassermann tests.....	536
Positives.....	119
Autogenous vaccines.....	25
Wound anaerobic cultures examined.....	60
<i>B. Welchii</i>	13
<i>Vibrion septique</i>	5
Histologic slides.....	504
Total examinations.....	27, 627

In addition to the foregoing, much miscellaneous work was performed in the center laboratory, such as daily examinations of raw water and treated water from each unit, examination of clothing harboring nits to determine efficiency of disinfesting apparatus, supply of cultures of hay bacillus to test sterilizing apparatus, isolation of milk-curdling organisms, bacteriological examination of doubtful canned foods, examination of chemicals from the local supply depot and of gonorrheal smears from the convalescent camp, and disinfection of mail and personal effects of inmates of the contagious wards.

CONVALESCENT CAMP

The convalescent camp at Allerey was organized June 26, 1918, the first group of convalescents, 11 officers and 116 enlisted men, arriving on July 31. The camp at first occupied one of the hospital sections, for it was not until September 19 that its tents were ready for occupancy. Meanwhile, its patients and duty personnel had been employed in completing construction of that unit, grading and draining the recreation field (1,060 feet by 700 feet), building roads and walks, pitching tents, etc. Electric wiring was completed by the end of October, and a Red Cross recreation hut, measuring 50 by 252 feet, was ready for use December 11. This hut, which had an important influence on the welfare of the camp and of the center at large, included an auditorium seating 1,500 persons, a stage, quarters for Red Cross personnel on duty in it, canteen space, writing and billiard tables, piano, etc. About half the hut was given over to basket ball, croquet, and a boxing ring.

Convalescents were organized into a regiment, subdivided into battalions of 1,000 men each, and these, in turn, into companies of 250 and platoons of 50. The staff consisted of the commanding officer (who also acted as inspector), a receiving and evacuating officer, an adjutant, a field adjutant, a supply officer, mess officer, physical director, six medical officers who sat on disability boards and cared for medical and surgical cases, respectively, and a sanitary inspector.

The adjutant's duties were of a dual character, one pertaining to military supervision, the other to medical records. In the former he was assisted by a regimental sergeant major, 1 duty sergeant, and 1 clerk; in the latter by 1 sergeant, first class, Medical Department, and 10 clerks, including 4 stenographers. This number was increased to 21 clerks when the camp reached its maximum strength, of approximately 6,000.

The regimental sergeant major prepared the camp morning report, sent a list of absentees to the assistant provost marshal, organized details for special duties, furnished lists of men on detached service, and took charge of many minor administrative details that arose, including supervision of the post office established in the camp and the card index of convalescents. The office of the sergeant, Medical Department, checked the field medical cards against the nominal roll received with each convoy, placed these in the dead file when men were to be evacuated, and forwarded them monthly to the chief surgeon, A. E. F., prepared diagnosis cards for all men admitted, listed B and C class cases for the camp disability board, prepared the roll of casualties and changes, and

listed outgoing men. At the time each platoon was examined, the platoon sergeant made one list of men placed in class A for his own use and one for the office so that the sergeant, Medical Department, knew, when an evacuation was ordered, which men were to be transferred. As travel orders were prepared in advance, this measure made it possible for an evacuation of 1,500 men to be effected within two hours after notice was received that transportation was available.

The field adjutant met and inspected incoming drafts, gave them a short talk on discipline, and, in the absence of the camp commander, inspected outgoing men and their equipment, marched them to the railroad station, superintended entraining and rationing for the journey. He was, furthermore, fire marshal and summary court officer of the camp and acted on passes for patients and duty personnel.

The supply officer was charged with reception and disposition of both medical and quartermaster property. He was assisted by 12 enlisted men who performed the following duties: General supervision, 1 sergeant; subsistence, including office and field work pertaining thereto, 1 sergeant; transportation of all supplies to kitchens subsisting men under the camp's jurisdiction but quartered outside of its main element, 1 sergeant; paper work pertaining to subsistence, 1 sergeant and 1 private; subsistence storeroom, 1 private; clothing, blankets, and other durable property, 1 sergeant and 2 privates; transportation of fuel, 1 sergeant; medical supplies, requisitions, and returns, 1 private.

The mess officer was assisted by 1 mess sergeant, 14 cooks and assistant cooks, 5 butchers, and necessary details of 20 men for kitchen police, 6 stokers, etc.

The physical director had charge of all calisthenic drills and exercises. These will be discussed below.

The sanitary inspector performed the duties indicated by his title, including supervision of water-heating appliances, bathrooms, bathing schedules, operation of delousing plants, and preparation and service of food, disposal of waste.

The convalescent officers rendered very valuable assistance in camp administration, and in the service of the center generally. Though patients, they took charge of details, conducted drills and inspections, organized the guard, and took command of troops en route to regulating stations.

Other departments in the organization of the camp were as follows: Pay office, 1 sergeant and 2 clerks; provost, 1 sergeant, 3 enlisted men; sanitation, 1 sergeant, 1 corporal and 3 privates for each incinerator, 1 corporal and 3 privates for each set of latrines; medical dispensary 1 noncommissioned officer; druggist, 1 private; surgical dispensary, 1 noncommissioned officer, 1 private; physical training, 1 sergeant for each company; fire department, 1 sergeant, 10 privates; prophylaxis, 2 corporals; baths, 1 corporal and 2 privates for each bath and ablution barrack, 1 corporal and 2 private for each laundry barrack; battalion organization, 1 battalion sergeant major, 1 duty sergeant, 1 clerk, 1 corporal of the sick; company organization, 1 first sergeant, 1 company duty sergeant, 1 orderly corporal, 1 clerk; platoon organization, 1 sergeant, 1 clerk.

Incoming drafts were received by the regimental duty sergeant, who arranged the men in two lines, one on each side of the infirmary, for inspection by medical officers. They were examined for vermin, scabies, venereal disease, and were classified as A, B, or C patients. After examination, those not rejected were formed in columns of squads and were marched to headquarters. There their field records, clothing, slips, etc., were checked, the roll called by the sergeant major and checked with the field medical cards. They were inspected by the camp commanding officer, who noted if their clothing and equipment were complete. Men rejected for any reason, such as physical ailment, vermin, and lack of equipment were returned with their field medical cards and appropriate notation to the hospital whence they came. Men passing medical and military inspection were then given a short talk on discipline, standing orders, and daily schedule, divided into detachments and assigned to platoons according to vacant bed reports. The platoon sergeants then listed names of men assigned to them, and gave the lists to the sergeant major, who checked them against the nominal rolls from base hospitals. The admission classification was given the platoon clerk.

The duties of the personnel were such as normally fall to men in comparable positions with line troops, except that the noncommissioned officers performed also some duties usually discharged by commissioned officers. The object of this measure was to reduce the commissioned staff of the camp to a minimum.

The battalion sergeant major received incoming men and distributed them among the companies. He saw that the men were properly quartered and fed, supervised sanitation and police, formed promptly all details called for, consolidated company morning reports, verified same, enforced orders from higher authority, and convoyed evacuation groups from his battalion to the railroad station. The battalion duty sergeant verified service details called for, checked battalion and company formations and all reports of company first sergeants, turned over delinquents to the labor squad, reported to the adjutant men returning from absence without leave, reported the battalion at drill formations and took command of it during the absence of the battalion sergeant major. The company first sergeants carried out orders from battalion headquarters, checked convalescents into and out of their companies, supervised all efforts to promote health and comfort of their men, furnished details promptly, verified company and platoon reports. The platoon sergeants informed the incoming men of the regulations of the camp, which were few as possible, checked absentees at formations, taps, and reveille, organized details promptly, made out nominal rolls, and marched platoons to the medical hut for classification.

The repeated classification of patients was one of the most important and probably the largest portion of the routine medical work in the camp. It was essential that the machinery for doing this be simple, adequate, and accurate. Therefore, men were examined, by platoons, at semiweekly intervals, and as their condition improved were advanced to a higher category. Those in class A constituted the standing evacuation list. A man remaining for from two to four weeks in class C was usually examined by the disability

board and assigned to suitable service for a limited period in the Services of Supply, after which he was reexamined.

The average stay in camp was from two to six weeks. If the convalescent period was longer than six weeks, the patient was examined by the disability board with a view to reclassification and appropriate transfer.

Accurate physical classification was essential to the success of the camp; therefore, the physical and recreation trainers kept new arrivals under close surveillance to notice lagging during exercises, with a view to reclassification if indicated. Men properly classified were soon infused with a spirit of enthusiasm and competition so that malingering was rarely found. Within one week all patients were carefully reexamined and reclassified. Men suffering from cardiac insufficiency, effort syndrome, joint diseases, war neuroses, effects of gassing, or were convalescent from infectious disease were assigned to special schedules. The medical staff included specialists for cardiac, pulmonary, and orthopedic conditions.

Second only to proper classification and prescription of appropriate exercises, the establishment of a cheerful and competitive spirit was looked upon as the most important factor in furthering convalescence. The treatment in general consisted of graded exercises, work that interested, and play that diverted and cheered. To keep the convalescents as fully occupied as possible, any measure that might promote among them good fellowship and light-heartedness was eagerly sought and practiced. Games productive of enthusiasm and merriment in which all participated were especially successful. As a measure of the success obtained, 95 per cent of the patients advanced regularly, upon the weekly physical examinations.

Because of the fact that many men in hospital tended to lose interest in military precision, personal responsibility and enthusiasm in their activities, the physical exercises for convalescents were diversified to meet these several needs. Commands were given from a drill stand, and as the troops were under the surveillance of their sergeant instructors, there was no difficulty in identifying delinquents. Parades and military formations before and after exercises helped appreciably. Garrison schedule was conducted with evening parade, which was attended by the band.

The routine of the camp was as follows: Reveille, 6.45; breakfast, 7.10; sick call, 7.30. At 8 a. m., the morning reports were received by the regimental sergeant major from battalion sergeant majors. From these reports the regimental report was made, the list of absentees being sent to assistant provost marshal. Service detachments were organized and distributed as requested. From 8 to 8.45 a. m., calisthenics; 9 to 9.15, running and walking; 9.25 to 9.40, athletic games. At 10 a. m., the guard was mounted; from 10 to 10.30, jumping exercises were held for other troops; 10.30, recall; 12, dinner; 1 p. m., first sergeant's call; 1.30 p. m. reception, inspection, and disposition of incoming convalescents; 2 p. m. athletics, 2.30 p. m., parade, inspection, and entraining of outgoing convalescents; 3.30 p. m., recall from calisthenics; 4.10 p. m., parade; 5, supper; 10.30 p. m., taps.

In order that the military purport of the training might not be slighted, the men were brought into platoon formation before and after each period. Sunday was a holiday.

It will be noted that calisthenics, games, etc., were conducted simultaneously with military formations which affected only certain details. Class C patients had a routine somewhat different from the foregoing schedule, which was for class A and class B men. Their schedule of exercises was as follows: From 8 to 8.45 a. m., exercises with A and B men; 9 to 9.15 a. m., short relay races, passing ball to rear of column, etc.; 9.30 to 9.40 a. m., falling exercises for the arms; 10 to 10.30, jumping contest with A and B men; 10.30 recall; 2 to 2.20, indoor base ball, or relay race; 2.45 to 3, passing the ball; 3.30, recall. Gassed cases received a special set of exercises.

Complementary to the schedule of exercise and drills was the system of employments. There was grave and urgent need that construction of the center be pushed as rapidly as possible, and for this purpose convalescents were detailed to the constructing engineer for service wherever needed. They proved indispensable, for the camp was a reservoir of highly skilled workmen, mechanics, clerks, chauffeurs, etc., as well as of unskilled labor. A labor bureau was maintained in the sergeant major's office. As occasion required, he called on company sergeants for lists of men for designated duties, listed them and assigned them for temporary duty, rations, and quarters to the unit making the request. After a variable period, determined by circumstances, these men were recalled and others detailed. In the same manner, carpentering, plumbing, and ditching details were kept up in the camp at all times.

The only patients receiving continued medical attention who were treated in the camp were the uncomplicated cases of venereal disease. Originally all such cases had been cared for in Base Hospital No. 56, but when this became overcrowded, the uncomplicated cases were transferred to the camp. The clinic there was found to function so satisfactory and disciplinary control was so effective that this clinic was continued until the camp closed.

As the reports were received daily from the medical examiners, lists of patients fit for evacuation were prepared and the men named therein were paraded for the inspection of the commanding officer. He inspected all equipment, assured himself that each man was fit for transfer, and ordered all who did not feel fit for duty to fall out. Such men were immediately reexamined by the disability board. The remainder, under the officer in charge of the movement, were marched to the railroad station with the band and field music. At the station, the command was divided into platoons of 40 men, with a noncommissioned officer in charge of each, and entrained. One noncommissioned and six men from each car loaded its rations. The travel order was checked by the sergeant major with the officer detailed to accompany the detachment to its destination.

Until October 14, 1918, the organization of two battalions of 1,000 men each was adequate, but thereafter the camp grew constantly until by December 9 it contained 6,004 men. This eventuated from the fact that evacuations from the center were stopped by higher authority and orders were received from the same source that men fit for duty be not carried as patients. To simplify administration and to reduce congestion, certain hospitals transferred men fit for duty to others and these operated under the jurisdiction of the convalescent camp. The largest incoming groups to the camp were on Novem-

ber 19, when 1,763 men were received. The largest outgoing group was 1,918 men on November 17.

Theatrical troupes, glee clubs, and orchestras were organized in the camp. Motion pictures of the center were taken and exhibited. A band of 35 pieces and a fife and drum corps of 15 pieces organized in the camp participated in military formations, assisted at theatrical performances, gave band concerts, etc. For a few weeks the band of the 155th Infantry was attached to the camp.

Provision was made from the outset for diversion of the men when the day's schedule was completed. In addition to the many entertainments procured from outside sources for the camp, a number were provided from local resources. The convalescent camp was closed January 31, 1919.

CLOSURE

As patients in the center diminished after January 1, when the ban on their transfer was lifted, hospitals were cleared and closed. Evacuation Hospital No. 19 was transferred to the army of occupation on the Rhine, and most of the personnel of Base Hospital No. 97 was retained to form Camp Hospital No. 108. With these exceptions all units were returned to the United States upon closure. On March 1 the center became the agricultural department of the American Expeditionary Forces University, whose headquarters were established at Beaune. On May 28, when the university ceased its activities at Allerey, this place was closed and turned over to the French.

COMMANDING OFFICER

Col. Joseph H. Ford, M. C.

CHAPTER XXIII

OTHER HOSPITAL CENTERS

HOSPITAL CENTER, BAZOILLES ^a

The hospital center at Bazoilles-sur-Meuse was located about 4 miles southwest of Neufchateau (Vosges) and was built around the small village of Bazoilles-sur-Meuse. The center was located on both sides of the River Meuse.

The site was well suited for a hospital. The moderate slope of the ground afforded excellent natural drainage and the Est Railroad ran through the village.

A group of six hospital sections, each accommodating 1,000 patients, was authorized, each section to have sufficient ground space for a tent expansion accommodating 1,000 beds. The capacity of the entire group was to be about 13,000 beds. This included one hospital unit (Base Hospital No. 18), which occupied buildings that had been erected around a château in Bazoilles and operated individually before the center was organized. Another unit, Base Hospital No. 66, at Neufchateau, about 4 miles from Bazoilles, was added later to the center. The Engineer Corps began construction toward the last of October, 1917, but progress was very slow. Macadamized roads were built, and the French railway authorities put in siding to accommodate hospital and freight trains. An unloading quay was provided for patients.

The commanding officer of the center arrived June 30, at which time the construction was far from complete. Sections 1, 5, and 6 were most advanced, but in them windows and plumbing fixtures were wanting. A warehouse was nearing completion and work on a steam laundry was just beginning, but this plant did not begin operating until October 10, 1918.

The project was reported completed, with the exception of minor changes, on November 1, 1918. Its cost was approximately \$2,027,266.

ADMINISTRATION

On July 2, 1918, when the center was officially organized, three base hospitals were present. The chief surgeon, A. E. F., furnished the following outline of the organization of the center, for which personnel would be furnished.

^a The statements of fact appearing herein are based on the "History of the Bazoilles hospital center," prepared under the direction of the commanding officer by members of his staff. The material used by these officers in the compilation of the history comprised official reports from the various divisions of the hospital center. The history is on file in the Historical Division, S. G. O.—*Ed.*

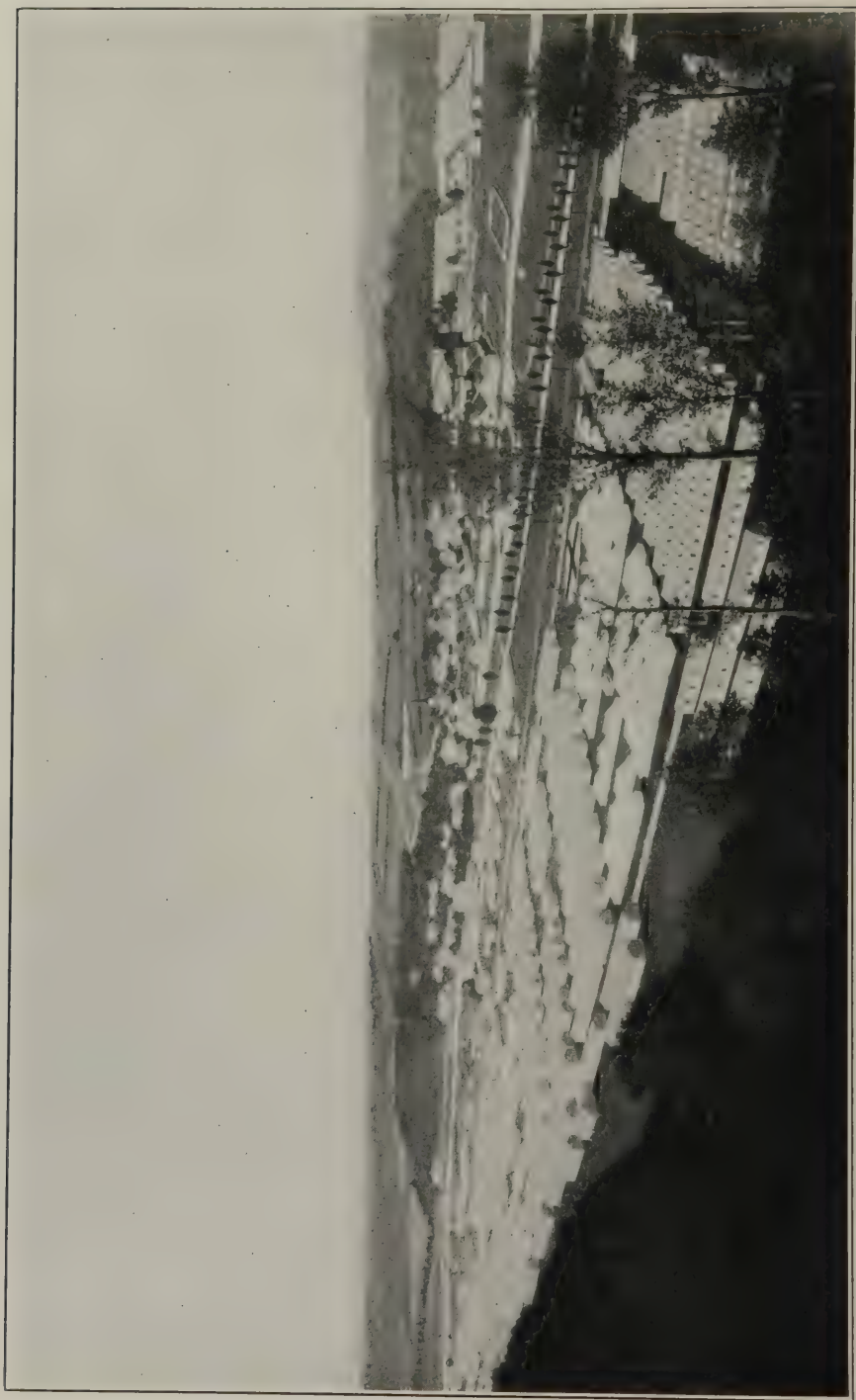


FIG. 101.—View of Bazoilles hospital center

AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON.

Memorandum to commanding officer, Bazoilles:

Table of organizations—central administration

	Officers	Enlisted men
Number of base hospital units, 7.		
Commanding officer and assistants (colonel or lieutenant colonel)	1	3
Adjutant and assistants (major or captain)	1	5
Medical supply officer (captain)	1	2
Laboratory officer (major or captain)	1	
Evacuation officer (major or captain)	1	1
Sanitary squads (captain or lieutenant)	2	52
Evacuation ambulance company (captain or lieutenant)	2	90
Subsistence, procurement, and issue; cold storage; clothing, equipment, procurement and issue; fuel, procurement and issue; salvage (captain or lieutenant, Quartermaster Corps)	2	a 26
Detachment and records; finance, paying, accounting, railway transportation (captain or lieutenant, Quartermaster Corps)	2	a 28
Technical labor troops to care for buildings, electric light plants, water system, drains (captain or lieutenant, Quartermaster Corps)	2	a 23
Labor troops performing purely common labor (30 to each base hospital unit)		a 210
Motor truck company	2	84
Assistant provost marshal (lieutenant)	1	10
Railway transportation officer (lieutenant)	2	6
Fire marshal (lieutenant)	1	2
Total	21	542

a Quartermaster.

* * * * *

QUARTERS ALLOWANCE

Administration, barracks	1 1/3
Officers' mess, barracks	1
Officers' quarters, barracks	1 1/3
Men's mess	2
Men's quarters	1 1/2
Total	7 1/6

Some of this staff personnel was sent from other stations, and some was taken from base hospital units of the center. The ambulance and truck companies did not arrive until after the armistice. No attempt was made at first to interrupt the customary administration routine of the hospitals, but as the center headquarters organization improved it was required that practically all reports, with the exception of the monthly sick and wounded report, be sent through the center commander.

The function of the headquarters was in general the same as in any other large military command. The center commander was able to keep in close touch with the activities within his command through various reports and returns, and by inspections, either personal or by members of his staff. Conferences with the unit commanders and among personnel employed on special work were of much value.

Various orders, bulletins, and circulars received from higher headquarters were distributed and the most important of these abstracted, or had attention called to them in special memoranda. The usual difficulties in getting officers among the personnel to read and study instructions were met with in a degree corresponding to the experience of the personnel, and an effort was made to overcome this by means of informatory memoranda and by requiring attendance upon formal instruction, devoting to it a certain number of hours each week for both officers and enlisted men.

The following data summarize the activities of the organizations forming the center:

Designation	Arrived	Began operation	Ceased operation	Departed
Base Hospital No. 18.....	July 26, 1917	July 31, 1917	Jan. 9, 1919	Jan. 18, 1919
Base Hospital No. 42.....	July 15, 1918	Aug. 6, 1918	Jan. 7, 1919	Jan. 29, 1919
Base Hospital No. 46.....	July 2, 1918	July 23, 1918	Jan. 1, 1919	Mar. 19, 1919
Base Hospital No. 60.....	Sept. 15, 1918	Oct. 4, 1918	Mar. 31, 1919	
Base Hospital No. 66 ^a	Jan. 13, 1918	Jan. 15, 1919	(^b)	
Base Hospital No. 79.....	Oct. 16, 1918	Nov. 5, 1918	(^c)	
Base Hospital No. 81.....	Sept. 25, 1918	Oct. 4, 1918	Mar. 31, 1919	
Base Hospital No. 116.....	Apr. 9, 1918	June 2, 1918	Jan. 31, 1919	Mar. 19, 1919
Evacuation Hospital No. 21.....	Jan. 4, 1919	Jan. 7, 1919	Apr. 22, 1919	
Provisional Base Hospital No. 1.....	do.....	Jan. 9, 1919	Apr. 27, 1919	
	(org.)			
Convalescent Camp No. 2.....	June 10, 1918	July 13, 1918	Jan. 25, 1919	Mar. 7, 1919
Sanitary squad No. 29.....	July 13, 1918			Mar. 12, 1919
Sanitary squad No. 30.....	do.....			Do.
School of Roentgenology.....	Sept. 1, 1918			Dec. 4, 1918
Evacuation Ambulance Company No. 10.....	Dec. 29, 1918			
Hospital unit A.....	Feb. 1, 1918	(^d)		Jan. 18, 1919

^a This unit, located at Neufchateau, was assigned to this center and first included in its bed report on Aug. 15, 1918.

^b Ceased to be part of center Nov. 10, 1918.

^c Still operating Apr. 30, 1919.

^d Attached to Base Hospital No. 18 (enlisted personnel only) on Feb. 4, 1918.

ENGINEER OPERATIONS

	Date of arrival
Companies B and C, 101st Engineers.....	Oct. 23, 1917
Companies C and F, 6th Engineers.....	Feb. 5, 1918
Company C, 502d Engineers Service Battalion.....	Feb. 8, 1918
Companies A and D, 508th Engineers Service Battalion.....	Feb. 11, 1918

At various intervals during construction, detachments of 23d, 26th, 28th, 33d, and 37th Engineers, 162d Labor Company (Portuguese), and Chinese Labor Company No. 26 were attached to 508th Engineers Service Battalion.

All engineer organizations withdrew from the center November 1, 1918.

MILITARY POLICE

Company L, 2d Pioneer Infantry, arrived July 27, 1918. On December 13, 1918, the detachment of 210th Company Military Police Corps was organized by transfers from Company L, 2d Pioneer Infantry.

LAUNDRY COMPANIES

Designation	Arrived	Departed
313th Mobile Laundry Company.....	Oct. 8, 1918	Feb. 27, 1919
505th Laundry Company.....	May 12, 1918	
517th Laundry Company.....	Sept. 13, 1918	
519th Laundry Company.....	Mar. 1, 1919	
Provisional Laundry Company 1, Company B.....	do.....	
162d Administrative Labor Battalion.....	Mar., 1918	Oct. 7, 1918
185th Administrative Labor Battalion (organized Sept. 13, 1918).....		

CASUAL ORGANIZATIONS

Designation	Arrived	Departed
Evacuation Hospital No. 2.....	(^a)	(^a)
Evacuation Hospital No. 6.....	(^a)	July 18, 1918
Evacuation Hospital No. 16.....	Sept. 23, 1918	Oct. 12, 1918
Evacuation Hospital No. 20.....	do.....	Oct. 2, 1918
Convalescent Camp No. 1.....	(^a)	Aug. 25, 1918
Mobile Operating Unit No. 1.....	July 18, 1918	Sept. 4, 1918
Evacuation Ambulance Company No. 64.....	Dec. 5, 1918	Dec. 15, 1918
115th Sanitary Train.....	Dec. 14, 1918	Dec. 29, 1918
Motor Supply Train No. 46.....	Oct. 23, 1918	Nov. 4, 1918
156th Infantry Band.....	Nov. 19, 1918	Dec. 5, 1918

^a Before organization of center.

In July and August, 1918, the quantity of water was insufficient. At one time it seemed as though the operation of the center would be seriously hampered on this account. Several wells were drilled and dug near the river and pumped to a collecting reservoir at the main pumping plant, where the water was chlorinated and pumped into the system through 3-inch turbine pumps. Water was drawn also from an old French system in Bazoilles, a booster pump being located at the spring about $3\frac{1}{2}$ miles south of the center.

The sewer system carried only the drainage from sinks and bathhouses, as the pail and soakage pit system was used for all latrines. Two Horsfall destructors were installed in each hospital unit. One sink was installed in



FIG. 102.—Covered walk connecting the wards at Base Hospital No. 18, Bazoilles hospital center

each ward and in other buildings as required. A part of the kitchen waste was burned; some was disposed of to civilians. When sold, usually little or nothing could be received for it, and sometimes it was necessary to pay for its removal.

Electrical power for lighting and X-ray machines was supplied by 19 generating units; eighteen 17-kilowatt and one 14-kilowatt machines being used. Each of the seven hospital units had a separate power plant and could be supplied independently with electric power from its own machines. Some trouble was experienced by the hospitals in adapting the large $7\frac{1}{2}$ -kilowatt X-ray machines to the 110-volt direct current furnished, as their rotary converter had been built for 220-volt direct current.

Disinfection of clothing and bedding was accomplished by means of large Thresh or American steam sterilizers. The Thresh apparatus was

stationary and required a good deal of labor and material. Six of these were received, one for each hospital section. Four were installed and work on others was stopped when hostilities ceased. The American sterilizers were portable and four hospitals used this type during the period of their activity. This model was considered the better of the two.

The supply service of this department was uniformly satisfactory, for rarely was there any shortage or inability to furnish articles. No bakery was operated, and bread was obtained from the Quartermaster Corps at Neuf-chateau. A small cold-storage plant was built, but was not operated, as weather was never sufficiently warm to require the use of a cold room. A small amount of ice was made, but the hospitals showed no inclination to make use of it.

From six to nine men were constantly employed as clerks, checkers, and packers. In addition, 10 men on an average were used in handling property; unloading it from cars and delivering it to hospital units. The amount of property received during the 10 months beginning July 1, 1918, aggregated 310 carloads. Supplies were received from supply depots at Is-sur-Tille, Gievres, Cosne, and the base ports. The American Red Cross also supplied 10 carloads of prepared dressings and mess and kitchen equipment. All supplies were formally transferred to supply officers of separate units on invoices. It was believed, however, that the issue of supplies on memorandum receipt would have been better, thus leaving the center supply officer accountable for all property in the center. This arrangement would have put one experienced man in charge rather than several who usually were very inexperienced.

On July 1, 1918, the available transportation was such as had been furnished to hospital units then operating, namely, 9 ambulances and 9 trucks, and other motor cars. The greater part was old and in poor condition, but no material additions were made until after signing of the armistice. Trucks were used for transportation of patients throughout the whole period prior to November 11, 1918.

In the latter months additional transportation was received, and on April 1, 1919, there were on hand: 11 motor cycles, 8 touring cars, 5 Ford ambulances, 15 G. M. C. ambulances, 6 Ford light trucks, 12 one and one-half and two ton trucks, and 30 three-ton trucks.

The pooling of all transportation was highly successful, for by so doing, the work of seven or eight hospital units was done with the normal allowance of two or three.

As all of the buildings of the center were of light wood construction and the intervals between hospitals were taken up with tentage, the fire hazard was very great. A center fire marshal was appointed, and working under his supervision each hospital unit had its local fire marshal in charge of a fire platoon. The loss from fire was insignificant. During the winter some hundreds of stoves were installed, usually in a very crude way. Many times fires started, but were extinguished almost at once.

A school was established and began operating January 4, 1919. Qualified enlisted men were detailed as instructors. Organization commanders were

required to have attend such men as were most in need of instruction, including those deficient in primary branches. By April the number of students reached a total of 167, and classes were held in reading, spelling, and writing, French, French history, United States history, civics, economics, mechanical drawing, and agriculture.

LABORATORY

At first the center laboratory was located in Base Hospital No. 18. Later a building was provided, and on September 2, 1918, the equipment was transferred to the new location. As the several units arrived in the hospital center the laboratory personnel of each unit came under the control of the laboratory officer of the center, who was empowered to detail them to the central laboratory as needed. The work of the laboratory was organized as noted below, but elasticity in the scheme was allowed in order that the personnel could assist in any department whose work might suddenly increase. There were eight general divisions, with one of the laboratory staff in charge of each, as follows:

1. General bacteriology—blood cultures, throat cultures, spinal fluid examination, and general bacteriologist work.
2. Typhoid-dysentery examination and water analysis.
3. Wound bacteriology.
4. Pneumococcus typing.
5. Serology.
6. Pathology. This department handled the surgical specimens submitted for diagnosis and performed all the post-mortem examinations into the hospital center.
7. Preparation room. This department made all stains and solutions used by the sterilization of discarded cultures and glass ware.
8. Office and supplies.

No chemical work was done in the central laboratory. All clinical pathology was done in the subsidiary laboratories and the center laboratories assisted in an advisory capacity. No operative procedures were done by the staff of the center laboratory.

OPTICAL AND OPHTHALMOLOGICAL DEPARTMENT

This service for the center was maintained at Base Hospital No. 18 until November, 1918, when it was transferred to Base Hospital No. 46. In May, 1918, an optical unit was added to this department. The personnel usually consisted of 5 officers and 6 enlisted men. This department served not only the center, but also a large part of the entire advance area, including other base hospitals in the vicinity and the army of occupation in Germany.

SCHOOL OF RÖENTGENOLOGY

A school of Roentgenology was established in August, 1918, its purpose being the provision, at a convenient point near the American front-line sector, of a school for the instruction of officers and enlisted men in various matters pertaining to X-ray work under war conditions and to maintain a depot from which skilled operators could be taken for service when needed. From September 1 to November 11, 1918, the school was in constant operation. Both officers and enlisted men were received and after a period of training sent to the front.

RECEIVING AND EVACUATION

The receiving and evacuating system was organized in July, 1918. The evacuating officer maintained control over all admissions, distribution, transfer, classification, and evacuation of all patients. During the earlier months of our military operations, unremitting efforts were made to evacuate to hospitals farther toward the rear; later, when the fighting progressed more nearly in the immediate front of this hospital center, all the hospitals were in reality functioning as evacuation hospitals. Frequently patients were received, operated upon, and transferred to the rear within 48 hours. During the Meuse-Argonne operation approximately 7,000 sick and wounded were received and about 12,000 evacuated. At this time, many of the wounded were received in bad shape. Conditions in the advanced area were such that many battle casualties did not reach the center for four or five days after receiving their wounds. A fair proportion had not been operated upon, and severe infections were present. The following charts show the admissions and dispositions in the center.

Admissions and dispositions, by hospitals, August 1, 1917, to April 30, 1919; hospital center, Bazailles-sur-Meuse, France, including hospitals operating independently prior to July 1, 1918

Hospitals	Base Hospital No. 18	Base Hospital No. 116	Base Hospital No. 46	Base Hospital No. 42	Base Hospital No. 66	Base Hospital No. 60	Base Hospital No. 81	Provisional Base Hospital No. 1	Evacuation Hospital No. 21	Base Hospital No. 79	Total
Period, Aug. 1, 1917, to June 30, 1918:											
Admissions	7,066	855									7,921
Disposed of	6,411	262									6,673
Remaining June 30, 1918	655	593									1,248
Period, July 1, 1918 to Apr. 30, 1919:											
Remaining July 1, 1918	665	593									1,248
Remaining at Base Hospital No. 66, Aug. 11, 1918					^a						
Admitted	7,106	11,526	8,323	7,111	^b 562 6,913	5,988	5,991	2,413	3,391	4,993	63,755
Total	7,761	12,119	8,323	7,111	7,475	5,988	5,991	2,413	3,391	4,993	65,565
Disposed of	7,424	11,328	7,915	6,443	6,624	5,723	5,781	2,261	3,240	4,781	61,520
Transferred	^c 337	^d 791	^e 408	^f 668	^g 851	^h 265	ⁱ 210	^j 152	^k 151		3,833
Remaining Apr. 30, 1919	0	0	0	0	0	0	0	0	0	^l 212	212

^a Base Hospital No. 66 was operating independently of the center until Aug. 11, 1918.

^b Number of patients in Base Hospital No. 66 when the organization came under the command of the center.

^c Transferred to Provisional Base Hospital No. 1 when Base Hospital No. 18 discontinued operations on Jan. 5, 1919.

^d Transferred to Base Hospital No. 79 when Base Hospital No. 116 discontinued operations on Jan. 31, 1919.

^e Transferred to various hospitals of center when Base Hospital No. 46 discontinued operations on Jan. 19, 1919.

^f Transferred to Evacuation Hospital No. 21 when Base Hospital No. 42 discontinued operations on Jan. 7, 1919.

^g Number of patients in Base Hospital No. 66 when the organization was taken from the command of the center.

^h Transferred to Evacuation Hospital No. 21 (165), Provisional Base Hospital No. 1 (100), when Base Hospital No. 60 discontinued operations on Mar. 31, 1919.

ⁱ Transferred to Base Hospital No. 79 (145), Provisional Base Hospital No. 1 (65), when Base Hospital No. 81 discontinued operations on Mar. 31, 1919.

^j Transferred to Base Hospital No. 79 when Provisional Base Hospital No. 1 discontinued operations on Apr. 27, 1919.

^k Transferred to Base Hospital No. 79 when Evacuation Hospital No. 21 discontinued operations on Apr. 22, 1919.

^l Remaining in Base Hospital No. 79, the only unit operating Apr. 30, 1919.

Summary of sick and injured admitted to hospital center, Bazoilles-sur-Meuse, France, July 1, 1918, to April 30, 1919

Cases of sickness	Total					Pneumonia	Dysentery	Malaria	Venereal	Paratyphoid	Typhoid	Measles	Cerebrospinal meningitis	Scarlet fever	All other cases
	Hospital	Quarters	Total	Disease	Injury										
Remaining ^a	1,248	0	1,248	447	801	5	0	0	24	20	0	0	0	2	416
Admitted	62,521	0	62,521	36,718	25,803	1,450	85	18	1,481	45	280	111	80	72	33,096
Total treated	63,769	0	63,769	37,165	26,604	1,455	85	18	1,505	45	280	111	80	74	33,512
Died	850	0	850	564	286	414	2	0	1	2	28	1	28	2	86
Transferred to organization	15,908	0	15,908	11,254	4,654	324	42	5	576	10	43	33	6	24	10,191
Otherwise disposed of ^b	46,799	0	46,799	25,135	21,664	705	41	12	828	33	209	67	43	48	23,149
Remaining sick ^c	212	0	212	212	0	12	0	1	100	0	0	10	3	0	86

^a The remaining 1,248 cases comprises total number of patients in Base Hospitals Nos. 18 and 116 on July 1, 1918, the date the hospital center was established.

^b Sent to other hospitals, replacement depots, regulating stations, etc.

^c In Base Hospital No. 79, the only hospital operating April 30, 1919.

Cases completed by hospitals operating independently prior to July 1, 1918: Base Hospital No. 18, 6,411; Base Hospital No. 116, 262; total, 6,673.

Cases evacuated by hospitals ceasing to operate to other hospitals in the center are included in admissions and discharges. Base Hospitals Nos. 46, 60, 79, and 81 were so evacuated.

Cases taken over from outgoing units by arriving units are not included in admissions and discharges. Base Hospitals Nos. 18, 42, and 116 were relieved by incoming organizations.

Thirty-two deaths occurring in prisoners of war and allied patients at Base Hospital No. 66, shown in total of 850 above, not included in table for admission and disposition.

AMERICAN RED CROSS

This was the only welfare organization authorized to operate in hospitals after August 31, 1918. Prior to January 1, 1919, the Y. M. C. A. conducted a canteen, religious services, and entertainments.

The buildings erected by the American Red Cross consisted of two very large and two smaller huts, operated by them for officers and nurses.

The representatives of the American Red Cross worked constantly in cooperation with the center and unit commanders, their chief functions consisting in searching for missing men and distributing supplies (Red Cross), writing letters for the patients, sending or procuring information from their homes, or any similar service which would relieve mental or physical trouble. Also they furnished athletic equipment, musical instruments, etc. In the huts were presented opportunity for refreshments, recreation, education, and entertainment. They contained billiard rooms, auditoriums, writing rooms, and rest rooms. There were on the average 8 entertainments and 32 moving-picture shows each week.

CONVALESCENT CAMP

The chief surgeon in a letter of June 21, 1918, ordered that a convalescent camp be operated in connection with the center. The proportion of beds was fixed at one convalescent bed to five of the base hospital capacity of the center, all crisis expansion accommodations being excluded. For this purpose, the number of active beds in buildings was assumed to be 7,000, thus fixing the bed capacity of the camp at 1,400. The site for the camp was selected at Liffolle-Grand, a village 4 miles west of Bazoilles. This site had been used at one time as a camp hospital and contained a number of small structures and a 14-room château. The personnel of Convalescent Camp No. 2, consisting of 10 officers and 90 enlisted men, arrived on June 10, 1918.

The preparation of buildings and grounds with provision of new barrack buildings, water supply, and roads was begun at once. A satisfactory water supply was not obtained until November, 1918.

The medical organization of the camp was quite simple. On admission after the bath, the patient was weighed, stripped. He was outfitted with essential clothing and assigned to a bed in the barracks. At once a physical examination was made, and he joined in the class work the following day. This class work consisted of physical exercise in the morning, followed by a short period of squad drill. After dinner and after an hour's complete relaxation in bed, he was sent on a mile march. On returning, he took part in various games according to his ability. After supper, varying amusements, held in the Y. M. C. A. hut, were available. At the discretion of the medical officer, he was promoted to Company 2, with its increased physical demands, and then to Company 3, where the work consisted of 40-minute setting-up exercises, an hour's squad drill, and a 5-mile march in the afternoon. By the time the patient had successfully passed the physical examination in this company and could successfully perform the strenuous exercises, he was discharged to duty. Men unable to meet these qualifications were reclassified. In the first 5,000 cases, there were less than 10 classified D. But there were probably about 7 per cent who proved unable to meet the tests. It is worthy of comment that these tests were of much greater value as a basis for classification than those heretofore employed; that is, the stethoscope, physician's opinion of patient's statement. Great emphasis was laid on the necessity for military discipline; and although on a patient's status, all convalescents were treated as soldiers training for the front line. Great difficulty was experienced in the lack of standardization of the type of patients received. Thus, one convoy would comprise a case of pneumonia out of bed one day, a mumps patient convalescent three weeks, a patient with flat-foot, gas cases of varying degrees of severity, and superficial gunshot wounds. An occasional valve lesion was discovered, a few cases of pulmonary tuberculosis were found, and not infrequently patients were sent directly from the admitting office to the camp hospital suffering from acute infections, such as bronchopneumonia, influenza, and tonsillitis. Another interesting feature is the fact that promotions were made daily instead of at weekly intervals. This increased markedly the capacity of the camp, and cut down the stay in camp of those physically fit on admission to the remarkably short period of 72 hours. It was this factor that allowed 2,431 admissions and 998 discharges in October, when the camp was in full working order.

A follow-up system was instituted, and the final proof of the success of the camp as measured by the ability of members of the outgoing drafts to perform front-line duty was supplied by the medical officers of units to which the patients were returned.

The constant support and assistance afforded by the American Red Cross carried the camp far beyond the standards obtainable under purely military control. Games and other equipment for the amusement of the patients were all supplied through this organization. A regular representative of that society did not arrive for some weeks after the camp was opened because of the lack of such officers, but thereafter it engaged in numerous activities for the promotion of morale.

The convalescent camp ceased to function on January 25, 1919.

DISCONTINUANCE

The Bazoilles center ceased operation May 1, 1919, evacuating on that date all patients remaining in Base Hospital No. 79 to Angers and Nantes. The shipment of all medical property remaining in the center began at once. A large quantity of beds and bedding already had been shipped to Treves. Other property was now shipped to the hospital center at Mars-sur-Allier for storage.

This center was the first to start as an organized center, and after 10 months of very active service was one of the last to close.

COMMANDING OFFICER

Col. Elmer A. Dean, M. C.

HOSPITAL CENTER, BEAU DESERT ^b

In the late fall of 1917, Beau Desert, in the vicinity of Bordeaux, was selected as the site for a hospital center, and construction was begun in December of that year. The site, about 5 miles west from Bordeaux and near the small village of Pichey, was a nearly level tract of land of approximately 550 acres.

Originally it was planned that there would be 10 base hospital units at this center, each of 1,000 beds, with an emergency expansion to 1,500, but during the summer of 1918 the construction of 7 additional units was authorized.

A railroad track built by the American engineers, which connected with the P. & O. Railway, ran through the center. The hospitals were located on either side of the track, thus affording rapid detraining and entraining of patients. The storehouses and laundry were also situated on this line, so that freight could easily be removed from cars to the loading platform.

Construction was effected by the United States Army Engineers. A large force of men was employed for this work, and during the summer of 1918 more than 4,000 American soldiers, prisoners of war, Chinese, and other laborers were at work. On June 22, 1918, when the first base hospital group arrived, only one unit had been completed. Nine hospital units were eventually completed, in addition to the convalescent camp, steam laundry, and warehouses, making a total of nearly 600 buildings. Twelve miles of gravel walk and 8 miles of board walk were constructed and 4 miles of roads and over 11 miles of railroad track were built.

When the Medical Department took over the center there were available a few old wells, mostly in a dirty condition. Only one of these was in use, furnishing about 50,000 gallons of water daily. This output was barely enough for drinking and a reasonable amount of washing, so that on many occasions the entire center was practically without water for 24 hours at a time and with none whatever for fire purposes. An artesian well, 1,500 feet deep, was sunk, but could not be used for some time through lack of a powerful enough pump. Later this well, connected with a 100,000-gallon cement storage tank, afforded ample supply.

^b The statements of fact appearing herein are based on the "History of The Beau Desert hospital center," prepared under the direction of the commanding officer by members of his staff. The material used by these officers in the compilation of the history comprised official reports from the various divisions of the hospital center. The history is on file in the Historical Division, S. G. O.—Ed.



FIG. 103.—Aerial view, Beale Desert Hospital center

Due to the very slight fall in the ground, laying sewers which would promptly carry off the waste water and take care of the drainage proved difficult: however, all the hospital units had a sewer system which emptied into a clarification tank, which in turn emptied into a small stream running through Pichey. The sewer system received only wash and waste water.

Human excreta were disposed of by the pail system. These vessels were emptied by contract with French laborers and buried 18 inches below the surface of the ground. At first an attempt was made to burn feces in Horsfall incinerators, but there were so few of these and the method was so unsatisfactory and expensive that the burial system was resorted to.



FIG. 104.—Beau Desert hospital center, showing railway facilities

Electric power was furnished by the French from Bordeaux. At first the system was very unsatisfactory, as the lights were frequently off and short circuits due to imperfect wiring were the rule rather than the exception. Eventually the powerhouse at Bordeaux was taken over by the Government, and after January 1, 1919, no trouble was experienced.

Early in August, 1918, a motor-transport officer was assigned to the center to organize the service. A motor-transport pool was established and the 312th Motor Truck Company was assigned to Beau Desert for duty. This service had grown from 1 ambulance and 4 trucks to 131 motor vehicles. All motor vehicles were pooled, subject to call from any organization at any time under certain restrictions imposed by orders from center headquarters.

ORGANIZATION AND ADMINISTRATION

The center was officially organized on July 6, 1918, the staff then consisted of the commanding officer and adjutant, assisted by two clerks. Later, when a large force was available, the center administration was organized as follows:

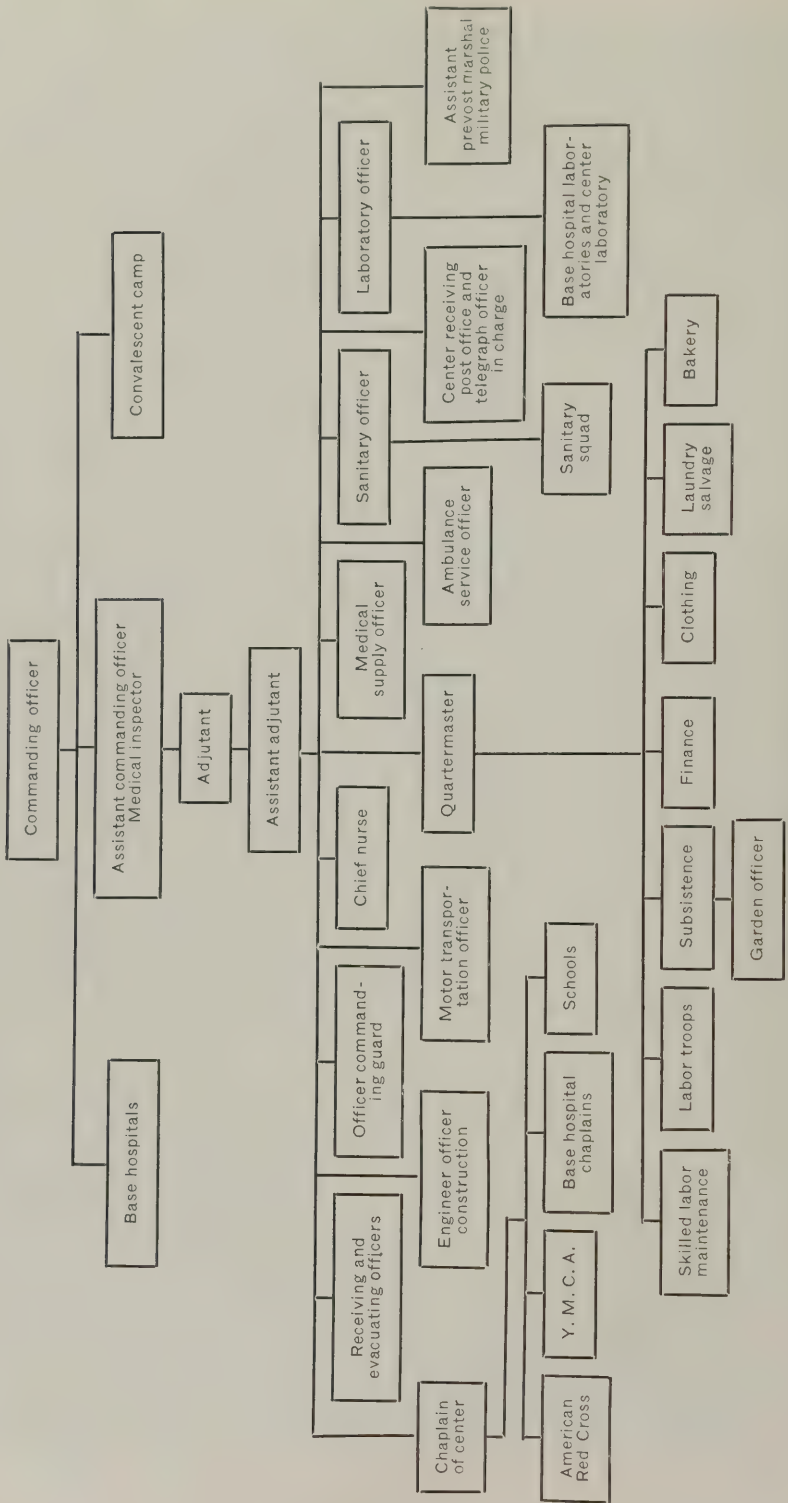


Diagram of central organization at Beau Desert

Though only two base hospital units arrived prior to the armistice, the following hospital units eventually were located at this center: Base Hospitals Nos. 22, 114, 104, 106, 111, 121, Evacuation Hospital No. 20, and the convalescent camp.

The sanitary inspector had general supervision of the sanitation of the entire center and was authorized to order the correction of such deficiencies as were in his judgment necessary.

A center chaplain was assigned in July, 1918. It was his duty to supervise the work of all chaplains in the center; also, he was directly responsible for the record of all deaths in the center, for the care of the cemetery, and all funerals.

The office of center chief nurse was not created until March, 1919, when changes in the nursing personnel became very numerous. The incumbent met all the chief nurses of base hospitals periodically, observed the work of nurses in all the hospitals, and recommended transfers in the interests of the service.

Shortly after the establishment of the center an officer of the Quartermaster Corps was appointed center fire marshal. Fire companies were organized in the different units and frequent drills were held. Great difficulty was experienced in obtaining fire-fighting apparatus and the extreme shortage of water in the summer of 1918 made fire hazard very serious. In its whole history the center had but one serious fire. This occurred on the night of February 6, 1919, a ward in one of the units being destroyed.

The center laboratory officer was in charge of all the laboratory activities. The staff consisted of 5 officers and 8 enlisted men. The laboratory made all important examinations, including Wassermann tests and routine examinations of water.

The medical supply depot occupied a building, 150 by 60 feet, with an adequate unloading platform, situated on a spur track. Supplies were received from the supply depots at Cosne, Brest, and Bordeaux. Large quantities of supplies were also purchased in open market.

The center quartermaster office was organized July 22, 1918, when it was divided into the following departments, each under charge of an officer or noncommissioned officer. Subsistence, finance, clothing and miscellaneous supplies, fuel procurement and issue, laundry, salvage and disposal of wastes, corral and stable, Quartermaster Corps detachment and labor troops. The bakery operated in the center for a short time but was then transferred to Camp de Souge, about 7 miles distant. Hospital laundry was at first done by the quartermaster at Bordeaux and by a French laundry, but in September, 1918, a large laundry was completed in the center. This center plant laundered all hospital garments of base section No. 2, and in addition did the bulk of the salvage work for the section. It operated 19 hours a day, with a personnel of 20 officers, 26 enlisted men, and 165 female civilian employees. During March, 1919, the plant laundered approximately 1,300,000 pieces.

The duties of the receiving and evacuating officer were specifically laid down in orders issued by the center. He was charged with meeting all hospital trains, the distribution of patients to the various hospitals of the center, according to their classification or instructions from the commanding officer, as well as the evacuation of all class A patients to the convalescent camps or to their organizations. The evacuation officer kept in touch with the railway

transport officer in Bordeaux as to the time of arrival of hospital trains, and boarded all the trains at Bordeaux. During the trip from Bordeaux to Beau Desert, which occupied from two to three hours, the receiving officer classified all patients. When each patient was classified, he was tagged with a large slip, showing the number of the hospital to which he was assigned. The majority of patients received in the center came on hospital trains; at times two or three trains arrived almost simultaneously. Ambulatory patients were always detrained first. Detraining for a full train occupied, on the average, one hour. These hospital trains were always furnished, when required, all the supplies they needed.

The evacuating officer was also responsible for the efficiency of receiving officers in the various hospitals and of the litter squads effecting reception and evacuation. He was the only officer authorized to give any orders to the train crew relative to switching points, stop, splitting of train, etc. He also kept a chart showing the rapidity of evacuation of each hospital. If it was found that a hospital was slowing up on its evacuation the reason was sought for by him and usually found to be due to failure of the ward surgeons promptly to report cases suitable for evacuation. Experience proved that the evacuation of class A patients from the hospitals averaged about 2 per cent of strength daily. Before the establishment of a convalescent camp, class A patients were evacuated direct from the hospitals to replacement depots. Each hospital was furnished each month with a chart showing the standing of the hospitals with regard to evacuation, thus creating a spirit of competition among them.

Shortly after the armistice began, the Beau Desert center was changed into an evacuation center. Base Hospitals Nos. 114 and 22, because of their experience, were designated as evacuating hospitals and the remaining four as receiving hospitals. Later only Base Hospital No. 22 performed this evacuation duty. In this way all the responsibility of evacuation was placed on one unit, thereby eliminating all differences in method and standards which would have existed if all the hospitals had been charged with evacuation. All patients for evacuation were divided, according to the classification required, into companies of 150 or less, all papers were completed, and five copies of passenger lists made for each company. All patients were examined physically, issued new uniforms, and paid in full. They were inspected when leaving the center and again while boarding the transport at Bordeaux. The following tables show the number of patients received and their disposition.

Total number of admissions and disposition of patients to April 1, 1919

Admitted by convoy.....	45, 398
Admitted from command.....	1, 840
Total.....	47, 238
Transferred to United States.....	22, 880
Returned to duty.....	12, 699
Died.....	304
Total.....	35, 883

Total number of hospital trains received, 84.

From April 1, to the date of closing of the hospital center, on June 25, 1919, 3,681 patients were received, making the total of cases handled over 51,000.

CONVALESCENT CAMP

This camp was organized late in July, 1918, and consisted of 25 wooden buildings and about 200 double hospital-ward tents, giving a capacity of about 4,500 beds, with a possible expansion to 8,000. The largest number ever accommodated was 3,800. No personnel was at first provided, and the hospital furnished the personnel required. Later, personnel was secured from officers and men that were unfitted for combatant service. The patients were divided into companies and battalions and given regular graded drills, exercise, and sports.

WELFARE WORK, SCHOOLS, ENTERTAINMENT, AND ATHLETICS

The welfare societies comprised the American Red Cross, Young Men's Christian Association, Knights of Columbus, and the Jewish Welfare Society. The American Red Cross, in addition to providing entertainment, furnished large quantities of hospital supplies. The Young Men's Christian Association confined its activities to the convalescent camp, providing there athletic entertainments and educational and musical programs. The aid extended by the Knights of Columbus was occasional and was rendered from Bordeaux. The Jewish Welfare Society conducted a clubhouse.

Post School was established on February 1, 1919, where at first only elementary courses for illiterates were given. Later, courses were given in higher mathematics, mechanical engineering, fine and applied arts, government, law, French, Spanish, shorthand, and typewriting.

COMMANDING OFFICER

Col. Harold W. Jones, M. C.

HOSPITAL CENTER, BEAUNE^c

This center was located close to the city of Beaune, Department Cote d'Or. Its construction was authorized on December 12, 1917, but did not commence until March, 1918.

A double-track spur from the Paris, Lyon & Mediterranean Railway ran east and west the full length of the center, and the hospital units were placed on both sides of this track. Ten units were planned, but only seven were constructed when hostilities ceased. Hospital construction, varying with the material available, was of brick, tile, concrete blocks, and poured concrete, with fabric cord roofs. One complete unit was of wooden Adrian barracks, but it was occupied throughout by construction personnel and never used as a hospital. Warehouses, laundry, and bakery were of galvanized iron. All units were built on the type A plan, each successive one being somewhat modified in detail, chiefly in the direction of economy of labor and material, with a view of speeding up the work. Special construction included the center laboratory building, located in unit 2, and a special neuropsychiatric building, which was used as an isolation ward for diphtheria and meningitis was located in unit 7.

^c The statements of fact appearing herein are based on the "History of the Beaune hospital center," prepared under the direction of the commanding officer by members of his staff. The material used by these officers in the compilation of the history comprised official reports from the various divisions of the hospital center. The history is on file in the Historical Division, S. G. O.—Ed.

Water at first was hauled from Beaune in large wine barrels; and later, about the time when first patients arrived, water from Beaune was piped into the center. Meanwhile the engineers were making efforts to develop an independent supply through driven wells, and were finally successful in locating an abundant artesian flow, from which about 500,000 gallons a day could be secured. Receiving tanks and pumps were installed and about the time the armistice began the water supply was fully provided for. The Beaune and artesian supplies were rather hard, but repeated laboratory tests showed them to be entirely potable at their source. However, the delivery pipes were badly contaminated, as tests showed the water to be dangerous for use as delivered through them, so that chlorination in Lyster bags was always practiced.

The bucket latrine system was used; solid matter was disposed of in Horsfall incinerators, and liquids were emptied through sewers into a septic tank.

One large steam sterilizer was used to disinfect all bedding and clothing. Electric power was brought into the center from Beaune. A permanent transformer was never installed, but only a temporary one of insufficient capacity was available, necessitating the use of a number of oil lamps and candles. An improvised Prest-O-Lite apparatus for emergency use was installed in each operating room. During November, 1918, an accident occurred by which the high-power transmission line became fouled with the lighting wires, resulting in the death by electrocution of 3 patients, 2 Hospital Corps men, and 1 civilian employee.

Laundry was handled at first by Mobile Laundry Unit No. 303, which arrived September 11, 1918; on September 19, the permanent laundry was put into operation by Mobile Laundry Unit No. 321.

The transportation consisted of 3 General Motors Co. ambulances, 3 trucks, 1 touring car, and 1 motor cycle. These were far insufficient, and trucks had to be used late into the night in order to handle the large amount of incoming supplies. Motor Transport Co. No. 477 arrived for duty on November 10, 1918, and took charge of all transportation.

The first base hospital unit arrived on July 31, 1918, and shortly afterwards the center was organized. The following units operated in this group: Base Hospitals Nos. 47, 61, 77, 80, 96; Evacuation Hospital No. 22, Sanitary Squad No. 22, and Hospital Train Unit No. 40; Evacuation Hospital No. 23 (September 19 to October 9, 1918), and Hospital Train Unit No. 45 (August 27 to October 31, 1918). None of the units brought their hospital equipment. The equipment was received from supply depots in various shipments and immediately installed, and as soon as a hospital was prepared to feed and house patients its beds were reported. Each hospital first received medical and minor surgical cases, the more severe ones going to the more completely equipped units. The matter of equipment and nurses chiefly governed the distribution of patients throughout. Special wards for officers, women, contagious and mental diseases were established, but the more detailed classification which was contemplated in the fully developed center was not put into effect.

Valuable assistance in the matter of medical supplies was given by the American Red Cross, especially in the way of blankets and prepared surgical dressings. A hut was furnished by this organization in each unit where concerts, dances, moving-picture shows, etc., were given.

CONVALESCENT CAMP

Convalescent camp was opened on October 7, 1918, and operated as such until January 31, 1919, handling approximately 5,000 patients. A disability board was appointed and evacuation began within a few days. The average length of stay of each patient in the camp was 11 days.



FIG. 105.—An operating room, Beaune hospital center

DISCONTINUANCE

The Beaune center was discontinued on March 29, 1919, and the site utilized for the American Expeditionary Forces University.

COMMANDING OFFICER

Col. Clarence J. Manley, M. C.

HOSPITAL CENTER, CLERMONT-FERRAND ^d

The hospital center, with headquarters at Clermont-Ferrand, was established on September 23, 1918, for the purpose of not only extending hospitalization of that district but also of unifying the hospitalization already established

^d The statements of fact appearing herein are based on the "History of the Clermont-Ferrand hospital center," prepared under the direction of the commanding officer by members of his staff. The material used by these officers in the compilation of the history comprised official reports from the various divisions of the hospital center. The history is on file in the Historical Division, S. G. O. — *Ed.*

there. This group included hospitals in the towns of Chatel-Guyon, Royat, Mont-Dore, la Bourboule, and Riom. These towns were composed almost entirely of summer hotels, the capacity of which varied from small villas of 15 to 20 rooms to large hotels of 250 to 300 rooms. Certain public and private buildings in the above places were taken over by the American Army, and plans were formulated for the establishment of six base hospitals with a capacity of 13,600 beds. Two base hospitals (Nos. 20 and 30) were functioning in Chatel-Guyon and Royat, respectively, when the center was organized.

Headquarters were established first at Royat, and on October 1 at Clermont-Ferrand. On October 17, a provisional base hospital was extemporized at Mont-Dore by drawing some personnel, and 100 convalescent patients from the two hospitals already operating. On November 6, 1918, Base Hospital No. 93 arrived and two days later Base Hospital No. 103. Base Hospital No. 103 never functioned as a hospital.

After the signing of the armistice further extension of the hospitalization in section was abandoned and buildings were gradually returned to the French. Discontinuance of the hospitalization in this region was completed about February 20, 1919.

The total number of patients cared for in this center was 17,042. This includes patients admitted prior to the organization of the group.

COMMANDING OFFICER

Col. John S. Lambie, M. C., September 23, 1918, to February 8, 1919.

Lieut. Col. John A. Murphy, M. C., February 9, 1919, to March 10, 1919.

HOSPITAL CENTER, COMMERCY *

This center was organized on November 4, 1918, at Commercy, where it occupied the Caserne Oudinot. Barracks were taken over also at Lerouville, a few kilometers northwest of Commercy. The buildings were of stone and in fairly good condition, but a great deal of renovating was necessary to make them suitable for hospital purposes. The windows were torn out, electric wiring was missing, sewers were blocked, and the water was unsafe for drinking. Evacuation Hospital No. 13 had been operating in the Caserne Oudinot since October 30, and was the only hospital in the center during the active period. Base Hospitals Nos. 91 and 90 arrived on November 30 and December 1, respectively. The former relieved Evacuation Hospital No. 13 and the latter took over the caserne at Lerouville, but never functioned as a hospital. During January, 1919, all patients were evacuated to Vichy and Bazoilles-sur-Meuse, and the center was discontinued on January 30, 1919.

COMMANDING OFFICER

Col. William A. Powell, M. C.

HOSPITAL CENTER, JOUE-LES-TOURS †

This center was established in the grounds of a château about 5 kilometers (3 miles) west of the city of Tours. The property was leased by the United

* The statements of fact appearing herein are based on the "History of the Commercy base hospital center," prepared under the direction of the commanding officer by members of his staff. The material used by these officers in the compilation of the history comprised official reports from the various divisions of the hospital center. The history is on file in the Historical Division, S. G. O. — *Ed.*

† The statements of fact appearing herein are based on the "History of the Joue-les-Tours hospital center," prepared under the direction of the commanding officer by members of his staff. The material used by these officers in the compilation of the history comprised official reports from the various divisions of the hospital center. The history is on file in the Historical Division, S. G. O. — *Ed.*

States Government from the owners in April, 1918, and two type A units and a convalescent camp were constructed by the United States Engineers. The entire center, including its water supply and sewerage system, was completed in October, 1918. The bed capacity of this group was 4,600 beds, but this capacity was never reached.

The method of handling the sick and wounded followed the usual procedure in base hospitals.

The center was operated by Base Hospital No. 7 from July 30, 1918, to the latter part of October, 1918, when Provisional Base Hospital No. 2 was organized. On January 18, 1919, Base Hospital No. 120 took over the activities of Base Hospital No. 7, thereafter, with Provisional Base Hospital No. 2, operating the center until its closure early in June following.



FIG. 106.—A view of part of Kerhuon hospital center

COMMANDING OFFICER

Col. Allen M. Smith, M. C., July 30, 1918, to January 17, 1919.

Col. Edward W. Pinkham, M. C., January 18, 1919, to closure of center.

HOSPITAL CENTER, KERHUON *

The hospital center at Kerhuon was situated 4 miles southeast of Brest and about $1\frac{1}{2}$ miles from the railroad station of Kerhuon. The center was planned to consist of 8 base hospitals, with a total capacity of 8,000 beds, for embarkation purposes; however, only 4,000 beds had been provided when the armistice was signed and further construction was abandoned.

* The statements of fact appearing herein are based on the "History of the Kerhuon hospital center," prepared under the direction of the commanding officer by members of his staff. The material used by these officers in the compilation of the history comprised official reports from the various divisions of the hospital center. The history is on file in the Historical Division, S. G. O.—Ed.

The construction of the center, according to the estimate of the Engineer Department, was to be completed by September 15, 1918. However, at that time only about 50 per cent of the buildings were under roof, few of them were entirely finished, the water and sewerage systems still were under construction, and there were no roads or walks of any kind.

The first unit (Base Hospital No. 65) reported on September 16, 1918, and on the 20th the center was organized. Subsequently, the following additional arrived: Base Hospitals Nos. 105, 92, 120. Unlike the other hospital centers of a like capacity, this center always operated as one hospital, this in view of the fact that at least 90 per cent of the activities were devoted to receiving, preparing, and evacuating patients to the United States, and one administration instead of four was desirable.

Approximately 75 per cent of the patients who passed through the center required little or no professional care. Bedridden medical and surgical cases and those requiring professional care were placed in two blocks of wards. The ambulatory cases requiring no professional care were placed in other wards regardless of their physical disability. Medical officers assigned to these wards acted more in the capacity of detachment commanders than ward surgeons; their principal duties were to see that all patients were properly clothed, equipped, and paid preparatory to their embarkation.

The evacuating activities were entirely dependent on space allotted patients on naval transports, on the one hand, and the availability of patients at other hospitals in France, on the other. It might be said that the center coordinated the patients with the vessels so that there was always on hand a sufficient number of patients under the classification demanded by the Navy to fill all space on vessels allotted to them. The Navy was represented by a naval medical officer who furnished the information relative to the dates of sailing and the space allotted for patients. The port of embarkation was represented by a medical officer of the army who, after consultation with the commanding officer of the center, made requisitions on the chief surgeon's office for patients to fill the Navy requirements. The chief surgeon, in turn, ordered patients from hospital centers at Savenay, Nantes, and Beau-Desert to the center at Kerhuon.

When information was received from the naval authorities that a vessel would sail on a certain date and the number and classification of patients required was forwarded, passenger lists of patients were prepared from those available for evacuation and patients tagged with colored tags, each color representing a certain physical classification. These tags were very much cherished by the patients and regarded by them as a ticket home. One-half hour before the evacuations were to begin a bugler sounded "assembly," followed by "overcoats." At this signal all patients who had been tagged repaired to their wards and thence marched to the receiving ward. Here a final inspection of their personnel appearance was made, their records were verified as to completeness, and they were then loaded on ambulances and taken to Pier No. 5, Port du Commerce, Brest. From here they were taken by steam lighters to the transports. This activity was so organized that frequently 1,100 patients were evacuated in less than three hours.

The following is a detailed outline of the evacuation system as operated in the center.

Evacuation Office, Hospital Center, Kerhuon, France

ADMINISTRATION OF RECEIVING, RECORDING, EQUIPPING, AND EVACUATING OF PATIENTS

Evacuation:

Receiving ward.
 Ward surgeon.
 Equipment.
 Statistical department.
 Registrar department.
 Tagging department.
 Liaison.

Function of receiving ward.—To receive patients sent to this hospital center and investigate source of admission as to authority and correctness; to receive papers and data; to assign patients to ward on information from evacuation office; to receive and check baggage and furnish runners to conduct patients to wards, and litter bearers for bedridden patients.

Reception of patients.—When notice is received of train arrivals a noncommissioned officer from this office is dispatched to the station. He represents this center and obtains information relative to convoys, etc., and accordingly makes out report, which is placed on file at this office.

REPORT OF HOSPITAL TRAINS, PATIENTS, BAGGAGE AND EQUIPMENT (ARRIVAL)

Hospital train No. ----- Date of arrival -----
 Number of patients in convoy: Officers, -----; enlisted men, -----; total, -----
 Embarked at -----; time, -----; date, -----
 Arrived at -----; time, -----; date, -----
 Detained at -----; time, -----
 Name of train commander -----
 Seriously ill on train -----
 Remarks: -----

 Condition of men on detraining ----- Time of loading ambulances -----
 First ambulance arriving HCK ----- Last ambulance arriving HCK -----
 Last patient sent to ward -----
 Number of patients not paid for preceding month -----
 Record shortage -----
 Baggage ----- Number of pieces ----- Sent via -----
 Condition ----- Shortage -----
 ----- Officers in charge train. ----- Number of attendants -----

Detraining Sergeant.

Evacuation Officer.

Patients arriving at this center are brought to the receiving ward, lined up and are given a slip of paper with the number of the ward to which assigned written thereon. Passing down the line they are questioned by medical officers who write on the ward assignment slip, data relative to pay, Navy classification and diagnosis taken from field medical and transfer cards; the latter in conformity with the Manual, Sick and Wounded, A. E. F. Patients then have an opportunity, if they desire, of handing over money or valuables to a representative of the registrar's office, for safe-keeping, to be given back when ready to be evacuated to the United States. They then pass on to the clerical room, where a force of about 12 typists fill out the Form 55a complete in quadruple, getting the data from the patient and from the records in his possession. The patients are then sent to the ward to which assigned. This work can be accomplished at a rate of about 175 men per hour.

Ward surgeon.—We depend upon the ward surgeon for the accurate and easy running of the mechanism—first, when patients arrive in the ward, verification of data on the Form 55a, any change in Navy classification, diagnosis or delayed evacuation to be made on form provided.

CONTAGIOUS DISEASE—CHANGE OF DIAGNOSIS—CHANGE OF CLASSIFICATION—DELAYED EVACUATION—RELEASES FOR EVACUATION

Note: _____

 Chiefs of service.

Ward _____ Date _____
 Name _____
 Serial No. _____ Rank _____ Organization _____
 Navy class _____ Navy class new _____
 Admission diagnosis _____
 Present diagnosis _____
 Noted by registrar _____
 Reason for delayed evacuation _____
 Ward surgeon _____
 Approved by chief of service _____
 Received by evacuation officer _____

This form is sent to evacuation and registrar's office within 24 hours, if possible.
 Second, transfer of patients from one ward to another. This should be carefully recorded by use of the following transfer form.

HOSPITAL CENTER, KERHUON—TRANSFER OF PATIENTS

Request transfer of this patient from ward _____ to ward _____
 Name _____ No. _____
 Rank _____ Organization _____
 Diagnosis _____
 Navy class _____ Navy class, new _____
 Reason for transfer _____

Approved: _____

Chief of { Medical.
 { Service transportation.
 { Surgical.

Ward No. _____ Ward Surgeon.

Approved: _____

Chief of { Medical.
 { Service records.
 { Surgical.

Base Hospital No. _____

The above patient will be transferred to ward _____ Base Hospital No. _____

Notice to detachment commander to transfer above patient. Registrar.

Received the above patient.

Detachment Commander.

Ward Surgeon, ward _____

Notice received of transfer. Date _____ EVACUATING OFFICE.
 _____ Time _____

Change in file made by _____

Evacuating Officer.

To receiving officer, to note and return to evacuating officer.

Receiving Officer.

The question of diagnosis is carefully considered and any change is immediately reported, through proper channels, to the registrar and evacuation office.

EQUIPMENT

Equipment officer.—The function of this officer is to see that the enlisted patients coming into this hospital are made ready to be evacuated as soon as possible, and that all existing orders relating thereto are complied with. When patients are sent to the ward, a careful inspection of the personal equipment is made by the ward surgeon, and any shortage noted.

The articles to complete the personal equipment are immediately drawn from the quartermaster and supplied to the patients.

After careful inspection of their physical condition, the ward surgeon submits a list of those ready for inspection to the local inspector who notifies the inspector general at base headquarters, and the section inspector comes out and certifies to the equipment, physical condition, and pay of each man.

This certificate is made in duplicate on blanks provided for that purpose, one of which is retained by the patient until he reaches the receiving ward on evacuation, where a final inspection is made. This certificate is retained with the hospital records. The original copy accompanies the patient.

This form is shown below:

General Orders, No. 3, Hospital Center Kerhuon, January 10, 1919.

1. The physical examination of patients and the completion of their equipment must be certified by the ward surgeon within the period of 24 hours after a patient is admitted to the hospital. The certificate will be made in duplicate on the evacuation-inspection slips which have been provided for the purpose.

2. In each case one of the certificates will be retained by the patient until he reaches the evacuation office, where it will be required by the evacuation officer before the patient is allowed to leave the hospital.

3. The other certificate will be transmitted by the ward surgeon through military channels to the section director.

4. The section director each day, at 2 p. m., will supply the representative of the inspector general's office with the certificates of patients who are prepared for inspection.

5. The certificates furnished by the section chiefs will be used by inspection department to compile a list of the patients who are prepared for inspection.

6. These certificates, after having been initialed by the inspector general, will be delivered to the evacuation officer and will be filed in the patient's envelopes with their other records.

7. Upon notification that the inspector general is prepared to inspect the patients in any ward, the ward surgeon will direct that the equipment of the patients concerned be displayed on their beds in an orderly manner so that every article may be easily seen. When physically able to do so, the patient will stand by his bed dressed as when he will embark upon the ship. His identification tags must be worn about the neck and displayed outside his clothing.

HOSPITAL CENTER, KERHUON, BREST—EVACUATION INSPECTION SLIPS

Ward	Classification	Date
Name		No.
Rank		Organization

Complete equipment:

Cap	1	Blankets, olive drab	3
Coat, olive drab	1	Barrack bag	1
Breeches, olive drab	1	Canteen and cover	1
Belt, waist	1	Gloves, pairs	1
Leggins	1	Laces, shoe, pairs	1
Shoes	1	Tags, identification	1
Overcoat	1	Ornaments, collar, cap	3
Shirts, olive drab	2	Toilet kit, complete	1
Undershirts	2	Cup	1
Drawers	2	Knife	1
Socks, pairs	4	Fork (1 spoon)	1
Slicker	1	Meat can	1

I have received the articles checked on this list, required to complete equipment as shown on list.

I was paid in full to include month of _____ 1919, \$ _____

I certify that I did not enter the service in Europe.

_____,
Patient.

I certify this patient's equipment to be complete as shown by above list, except for initialed erasure of articles not available for issue.

Date _____ 1919.

(Name) _____,
(Rank) _____ *Ward Surgeon.*

I certify that I have examined this patient and found him free from communicable venereal diseases, from skin and contagious diseases, and vermin infestation.

(Name) _____,
(Rank) _____ *Ward Surgeon.*

Inspection, general:

I inspected this patient immediately before evacuation from the ward and found no evidence of acute infection in eyes, nose, throat, skin, or general condition to contradict evacuation, and has no explosives or combustibles.

(Name) _____,
(Rank) _____ *Ward Surgeon.*

Evacuated _____ Date _____

S. S. _____

The detail of this process is outlined as follows:

Before the sick and wounded are ready to return to the United States a number of conditions must be satisfied, including:

1. The physical condition of the patient must be such as to insure his safe transportation.
2. He must not be suffering from a communicable disease or vermin infestation, thereby endangering the health of his traveling companions.
3. He must be provided with clothing which will afford him protection and, in the case of ambulatory patients, they must present a neat and military appearance.
4. He must have been paid in full to include the month preceding his embarkation for the United States.
5. His service record must accompany him, if available; and, if not, a supplementary service record must be provided.
6. All foreign money must be exchanged for American money.

EQUIPPING THE PATIENT

Immediately after the reception of the patient in the ward the ward surgeon proceeds with the preparation of the patient for evacuation, and takes the following steps:

(a) The equipment which the patient possesses is orderly displayed upon his bed and checked against the specified list given on page 8 of Embarkation Instructions No. 13, January 4, 1919, headquarters, Services of Supply, A. E. F.

(b) The articles mentioned in the aforesaid list which are not in the possession of the patient are immediately requisitioned from the quartermaster. If the quartermaster is unable to supply any of the articles requisitioned he certifies to that fact.

(c) Inquiry is made of the patient regarding the pay he has received and he is required to state over his own signature the amount and the period of time covered.

(d) Inquiry is made as to whether or not he enlisted in Europe, if so, whether he desires demobilization in the United States, under provision of General Orders No. 40, G. H. Q., paragraphs 1-6. If he so desire, the attached declaration is used and information sent to base commander through military channels.

HOSPITAL CENTER, KERHUON,
BASE SECTION No. 5, A. P. O. 716,
(Date) _____, 1919.

Under the provision of General Orders No. 40, paragraphs 1-6, G. H. Q., March 3, 1919, I, _____, hereby declare that I entered the service of the United States in Europe, at _____, on (date) _____; I desire to be retained in the service for the purpose of returning to the United States for discharge. I understand that I am privileged to be discharged in Europe if I so desire. I do not request to be retained in the service for the purpose of returning to the United States for discharge. In consideration of this privilege of being returned to the United States, I waive all claim for travel allowance from the place of discharge to the place of entry into the service, and fully understand that I will be discharged at the demobilization center nearest my home and that I must defray my expenses from the demobilization center at which discharged to my home.

Witness: _____

(e) The physical inspection of the patient determines whether or not he is suffering from communicable venereal disease, skin diseases, contagious diseases, or vermin infestation.

(f) The requisition upon the quartermaster having been filled and the articles thus acquired having been added to those already in the possession of the patient, the ward surgeon now makes a final check to determine that the patient's equipment is in full accord with the instructions contained in Embarkation Instructions No. 13.

NOTIFICATION BY THE WARD SURGEON

The ward surgeon now requests the chief of the service to verify the findings which he has recorded with regard to the patient's physical condition, equipment, and pay.

The chief of the medical service confirms the findings whenever a patient is reported suffering from vermin infestation, communicable diseases, etc.

A representative of the inspector general's office visits the ward and confirms the fact that the patient is properly equipped for evacuation to the United States, initialing the record in evidence of the fact that this inspection has been made.

The statistical officer verifies the pay status of the patient and prepares his service record for return to the United States.

CERTIFICATION

The correctness of the findings which have been enumerated is attested by proper signature. The patient acknowledges over his signature the correctness of the statement regarding his pay and also that the required equipment for evacuation is in his possession.

The ward surgeon certifies that the patient has been equipped in a proper manner and also signs a certificate indicating that the patient may be transported to America with safety to himself and without endangering his fellow passengers from vermin or communicable diseases.

As a period of a few days may elapse between the time when a patient arrives in the hospital and the time when he is placed upon the passenger list, the ward surgeon makes a final inspection in each case in order that he may give the proper assurance regarding the suitability of every case for evacuation. This final certificate covers the question of acute infection, vermin infestation, and venereal disease.

WOUND CHEVRONS

General Orders, No. 110, general headquarters, A. E. F., July 7, 1918, prescribes the conditions under which wound chevrons may be worn. Many wounded men have been unable to secure authority to wear these chevrons, due to the loss of necessary papers. To obviate this difficulty, telegraphic authority was given to the commanding officer of this center to take the affidavit of any man whose papers were lost or confused. As a matter of practice it is found that greater speed is obtained and better records made available for our own protection if the affidavits are prepared in each case. As soon as the patients are assigned

to the ward, the ward surgeon asks for all men to notify him who have never had an order authorizing the wearing of his wound chevron. The ward surgeon prepares an affidavit showing, name, rank, company, organization, number, place of action where wound was obtained, nature of missile or gas, part of body injured, and date of injury. This blank is sent to the adjutant's office. The adjutant sends a commissioned officer, having power to administer an oath, to see the soldier and attest his signature on the affidavit. This affidavit is returned to the adjutant's office, and a special order issued authorizing the individual to wear a wound chevron for the wound specified. Two chevrons are then issued to the men with the order authorizing their use, one for the coat and one for the overcoat. If the patient already has an order but no chevron, a chevron is issued and a notation made on the order. If one chevron only is needed for the overcoat, one is issued for that purpose. In the month of March, about 800 wound chevrons were issued.

HOSPITAL CENTER, KERHUON, FRANCE

A. P. O. 716

(Date) _____, 1919.

Personally appeared before me, the undersigned authority, one _____,
 _____, who, after being duly sworn, deposes and sayeth, I was (1) wounded
 (Number)

while in action with the enemy; (2) wounded as a result of an act of the enemy; (3) was
 gassed, which necessitated treatment by a medical officer at _____,
 (Place)

_____ That the wound was due to _____
 (Date) (Nature of weapon)

and I was wounded in _____; that I am not now wearing a
 (Part of body injured)

wound chevron for this wound.

Further deponent sayeth not.

Ward _____

(Name, rank, and organization)

Sworn to and subscribed before me this _____ day of _____, 1919.

HEADQUARTERS, HOSPITAL CENTER, KERHUON, FRANCE

A. P. O. 716

(Date) _____, 1919.

Special Order No. _____

EXTRACT

* * * * *
 PAR. Pursuant to telegraphic authority, headquarters, Services of Supply, 8th February, 1919, the following-named men, having been wounded in action with the enemy, or as the result of an act of the enemy, on the date and at the place specified opposite their names, are hereby authorized to wear the wound chevron prescribed in G. O. 110, G. H. Q., July 7, 1918:

Name	Number	Rank	Organization	Date and place of injury

By order of Colonel Koerper:

FREDERICK THOMAS,
 Major, Sanitary Corps, Adjutant.

Ward _____

Original copy.

SERVICE STRIPES

This matter is taken up with every man coming into this center, and handled in a similar manner to wound chevrons. Many men are found who are not wearing service stripes, although entitled to them. In the month of March about 3,000 service chevrons were issued and authorized as per order attached.

HEADQUARTERS, HOSPITAL CENTER, KERHUON, FRANCE

A. P. O. 716

(Date) _____, 1919.

Special Order No. _____

EXTRACT

* * * * *

PAR.. Pursuant to the provisions of G. O. 110, sec. 1, Hqrs., A. E. F., July 7, 1918, as amended by G. O. 147, sec. 3, par. 4, Hqrs., A. E. F., Sept. 2, 1918, permission is hereby granted the following-named members of the American Expeditionary Forces, now at this hospital center, to wear _____ war service chevrons.

Name	Number	Rank	Company	Organization	Date of arrival
-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----

By order of Colonel Koerper:

FREDERICK THOMAS,
Major, Sanitary Corps, Adjutant.

Ward _____
Original copy.

EVACUATION

The evacuability of a patient is indicated when the ward surgeon forwards, through military channels, the evacuation—inspection slips, which contain the certificates referred to above. This slip is made in duplicate, one of which is taken up by the inspector; when all are collected a list is made and handed to evacuation department, which thereupon releases the equipment check of patient, kept on file at evacuation office. The duplicate slip is kept by patient, who brings it to the receiving ward and when he is checked on the passenger list he hands the slip to the inspector, who examines it once more to insure correctness and then places it in the patient's envelope. This envelope is then given directly to the detachment commander. At this point the patient is given the final inspection as to neatness and military appearance.

FORMATION INTO DETACHMENTS

Prior to evacuation, patients are grouped into detachments of 75 to 150 and placed in the charge of a medical officer, who receives the records relating to the patients and conveys them to the United States.

STATISTICAL

The function of this department is to see that the service records are complete; or if not and not obtainable, to provide supplemental service records, and to see about pay for every man. A roster of detachments of men to be evacuated, which is the passenger list of the evacuation office, is submitted to this department, and 12 copies of passenger list made from the data contained thereon. Two copies of the twelve contain red-ink notations concerning the absence of service records. These copies are disposed of as follows:

- 5 copies for personnel adjutant, United States port of debarkation.
- 2 copies to central records office.
- 1 copy to headquarters, Services of Supply.
- 1 copy to be retained at port of embarkation, A. E. F.
- 1 copy for executive officers on board ship.
- 1 copy to The Adjutant General of the Army.
- 1 copy to detachment commander.

REGISTRAR

The registrar accepts one of the Forms 55a, places it in live file; when passenger list is called for and patient ready to go out the Form 55a is taken out, stamped with proper date, and placed in dead file.

TAGGING

This department receives a copy of passenger list, and fills out the tag, form shown below:

P. L. No. _____ Detachment _____ Class _____
Name _____
Rank _____ Serial No. _____
Company _____ Organization _____
Diagnosis _____
Home State _____ Ward No. _____

The patients are tagged in the wards, and made readily distinguishable and ready to go to the receiving ward for final inspection and loading when called for.

Tags are colored, denoting classifications:

- White—Walking, no dressing _____ (WND a, b)
- Green—Walking, dressing _____ (WD a, b, c)
- Yellow—Tubercular _____ (TB a, b, c)
- Red—Mental _____ (Ment a, b)
- Blue—Bedridden _____ (BR a, b)

Barrack tags.—Tags are made in duplicate, one part is tied on the barrack bag and the other the patient keeps in his possession.

Det. 278. No. 50 | Det. 278. No. 50.
John Doe | John Doe
Pvt. 1/cl. | Pvt. 1/cl.

OFFICE SURGEON, BASE SECTION No. 5, A. P. O. 716,
(Date) March 24, 1919.

To: C. O., Hospital Center, Kerhuon, France.

Requisition for classified patients for evacuation to transport:

Transport: S. S. Mount Vernon.

Date of sailing: March 28, 1919.

Hour for ambulance loading: 8:00 a. m.

	Bed ridden		Walking, dressing			Walking, no dressing		T. B.			Mental		Total
	A	B	A	B	C	A	B	A	B	C	A	B	
Officers _____													
Enlisted men _____		10				50	750						810
Nurses _____													
Total _____		10				50	750						810

(Signed) _____,
Captain, M. C., Assistant Adjutant.

LIAISON

The duty of this department is to keep in touch with the base evacuation officer and other points that send patients to this center for evacuation to the United States; to arrange for their reception and requisition through office when needed; to keep live statistics on the general information board as to movement of patients and nurses, and expected arrivals of ships. In other words, to coordinate all outside information that has to do with the reception and evacuation of patients, and to maintain a sufficient number of patients at all times to fill the requisitions made by the Navy.

* * * * *

The physical function of evacuating patients is as follows:

When the passenger list is completed the following form is made out:

EVACUATION OFFICE,
HOSPITAL CENTER, KERHUON, A. P. O. 716,

Memorandum: _____, 1919.

1. Loading from the S. S. _____ will start at _____ M.

_____, 1919.

The following detachments will load:

Detachment No. _____	In command of _____
Detachment No. _____	In command of _____
Detachment No. _____	In command of _____
Detachment No. _____	In command of _____
Detachment No. _____	In command of _____
Detachment No. _____	In command of _____
Detachment No. _____	In command of _____
Detachment No. _____	In command of _____

2. Evacuation will take place from the following wards:

_____,
Evacuation Officer.

Copies to—

Commanding officer, Base Hospital No. 65.
Chief of professional services.
Chief of medical service.
Chief of surgical service.
Chief nurse.
Detachment commander.
Receiving officer.
Mess officer.
Baggage sergeant.
File.

These are sent to officers that are in any way connected with the process that they may be informed and have patients designated to go at appointed hour. To the receiving officer is sent, first, a "ward check," that he may know the wards from which the patients are to be called, their number, and classification:

Detachment No. 136:

Enlisted men—

	J2	J4	J5	J6
BRb. _____	3	10	34	1
WNDb. _____	Y7	Y4		
	45	5		

Detachment No. 137:

Enlisted men—

	Y7	Z1	X2	D7
WNDb. _____	30	22	2	1
	A3	E5	X2	A4
TBc. _____	31	19	2	17

Detachment No. 138:

Enlisted men—

	A3	A4	A6	J1	E5	E6		
TBa-----	8	3	16	12	7	4		
TBc-----	A6	J1	E6					
	16	3	1					
WNBd-----	Z1	Z2	Y7	C6	H10	H9	F3	D5
	1	1	9	1	3	1	3	2
	C1	E4	E3	E2				
	2	4	1	1				

Detachment No. 139:

Enlisted men—

	D3	D4			
WNBd-----	34	36			
WDa-----	C5	C4	H2	A1	C2
	2	11	1	26	10

Detachment No. 140:

Enlisted men—

	D4	D5	D6			
WNBd-----	4	38	28			
WDb-----	Z1	C6	Y3	C2	Z2	Y2
	4	2	3	3	2	1

Detachment No. 141:

Enlisted men—

	J7	C1	A8	A1	X2	A2	Z2	Z3
WNBd-----	29	13	21	4	8	1	20	53

Detachment No. 142:

Enlisted men—

	A9	A10	P2	P6
Mentb-----	24	38	4	6

Detachment No. 143:

Enlisted men—

	Z1	Z3	H9	D3	D2
WNBd-----	62	44	19	1	24

Detachment No. 144:

Enlisted men:—

	H9	H10	C5	C6
WNBd-----	21	37	29	38

Detachment No. 145:

Officers—

	B2	A1	B3	B4	B5	B6
WNBd-----	16	1	11	8	4	1
WNBa-----	B4	B5				
	1	1				
TBc-----	B2					
	1					
WDb-----	B5					
	2					
WDb-----	B4	B5				
	1	2				
WDa-----	B4	B5				
	1	1				

Detachment No. 146:

Nurses—

	K4
WNBd-----	22

Detachment No. 147:

Mental officers—

	B7
Mentb-----	32 or 33

Second, an office detachment sheet showing how each detachment is to be made up. An office detachment sheet is given below, showing the make-up of the passenger list of the Steamship *Leviathan*. This list, as will be noted, calls for most of the sick and wounded classification. It will be noted that the detachments are made up in "splits"; that is, not all are of the same class, the reasons for which are: First, evacuating facility; second, part of the detachment in the class are able to help the others, which tends to shorten the transportation time; third, it does not load up a detachment commander with a lot of one class of patients who might be sick and require a lot of attention and care.

OFFICE DETACHMENT SHEET STEAMSHIP "LEVIATHAN"

In command of convalescent detachment No. 138, Capt. ———:

(1) TBa (patients), 49 enlisted men, 1 civilian	50
TBc (patients)	20
WNDb (patients)	29
Total	99

In command of convalescent detachment No. 136, Maj. ———:

(2) BRb (patients)	49
WNDb (patients)	50
Total	99

(Supplemental 101 to 110.)

In command of convalescent detachment No. 137, First Lieut. ———:

(3) TBc (patients)	69
WNDb (patients)	55
Total	124

In command of convalescent detachment No. 142, Maj. ———:

(4) Mentb (patients)	58
Attendants	6
Total	64

In command of convalescent detachment No. 139, Capt. ———:

(5) WNDb (patients)	69
WDa (patients)	49
Total	118

In command of convalescent detachment No. 140, Capt. ———:

(6) WNDb (patients)	70
WDb (patients)	49
Supplemental list, WNDb (patients)	12
Total	131

In command of convalescent detachment No. 141, Capt. ———:

WNDb (patients)	148
-----------------	-----

In command of convalescent detachment No. 143, Maj. ———:

WNDb (patients)	150
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In command of convalescent detachment No. 144, Capt. ———:

WNDb (patients)	125
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In command of convalescent detachment No. 145, Lieut. Col. ———:

Officers—

TBc (patients)	1
WDa (patients)	2
WDb (patients)	3
WDe (patients)	2
WNDa (patients)	2
WNDb (patients)	40
Total	47

P./L.....
 P./L.....
 P. L.....
 Temporarily held.....
 Available.....
 Total.....
 Local patients.....
 Grand totals.....

The distribution of the Form 55a is made either immediately following the completion of its typing in the receiving ward, or as soon as the patients have passed through it, and sufficient time has been had to make a careful check as to diagnosis, etc., and to make comparison with the transfer card from the forwarding hospital and other papers which will come in on the convoy, but not in the possession of the patient. The original of the Form 55a which is retained in the receiving ward is filed according to wards, and the patient remains unavailable for evacuation until such time as he has been released from all checks. The Form 55a is transferred from the "hold-over" file to the "available" file, and there arranged according to the Navy classification and by wards.

A patient to be made evacuable must be equipped, paid in full to include the month preceding his evacuation to the United States, have his service record completed, not be awaiting trial by court-martial, be free from orthopedic complications and temporary illness. In other words these are six points which have to be considered and checked.

When this office is called on for a certain number of patients in the various classifications required by the Navy, the Forms 55a are "pulled" from the "available file" and blocked out and given the serial numbers to be used in making the passenger list. Typists prepare the passenger list. Approximately 10 per cent more names, if available, in each classification as called for by the Navy are placed on the passenger list and service records for this number called for. As the system works out we find that in practically every list there are a number of "hold-ups" at the last moment, so that as a name is scratched one of the other names is used to fill in. Those that are not needed are scratched. After the passenger list is complete, the Forms 55a are kept in their respective order, to be accessible, in case anything arises requiring their use for reference, until the patient is actually evacuated. For instance, if at the last minute a patient for evacuation is found too ill to travel, change will be made. When the evacuation is accomplished and the patients have gone to the ship, final disposition is made of the Form 55a by marking each copy with the number of the special order and paragraph which authorizes the patient's evacuation, giving date and ship on which he travels. They are then filed alphabetically as a permanent record of this office.

Seventeen copies of a passenger list are made by the evacuation office; disposition as follows:

- 4 to transport surgeon for use at port of debarkation.
- 1 to chief surgeon, A. E. F. (through base surgeon).
- 1 to base surgeon.
- 1 to statistical and registrar departments.
- 8 to Army and Navy medical authorities.
- 1 retained for tagging and permanent file.

RED CROSS HUT ACTIVITIES

Previous to arrival of a convoy the American Red Cross is notified by the receiving department. When the patients arrive and are awaiting registration, hot chocolate is served, and cigarettes are passed.

When patients go out, representatives of the Red Cross are present and supply each patient as he passes by the desk with a cigarette, giving him a light and a parting word before he gets into the ambulance. This detail, while small in itself, is important, as it serves to leave a good impression in the minds of the patients.

COMMANDING OFFICER

Col. Clyde S. Ford, M. C., September 20, 1918, to February 11, 1919.

Col. Conrad E. Koerper, M. C., February 12, 1919, to discontinuance of center.

HOSPITAL CENTER, LANGRES ^a

This hospital center was situated about three-fourths of a mile to the east of the city of Langres. Construction of the center began during the early part of the summer, 1918, but delay in receipt of building material and the shortage of labor prevented its completion until after the armistice began. The original plans for this center contemplated four base hospitals and a convalescent camp; however, buildings for only two base hospitals, a convalescent camp, and for the center administration were constructed.

To the wooden buildings were added later, 36 marquee tents, crisis expansion, to each base hospital, and 72 to the convalescent camp. This addition gave each hospital a capacity of 1,500 and 1,000 to the convalescent camp, a total of 4,000 available beds for the entire center.

The center was organized on August 15, 1918. At this time the permanent buildings were partially completed, most of the roads and a few walks laid, the electric plants in operation, and water and sewer pipes laid.

The administrative staff of the center was organized into the following divisions: Adjutant, evacuating officer, sanitary officer, medical supply officer, laboratory officer, and quartermaster.

The following units comprised the center: Base Hospital No. 53; Evacuation Hospital No. 18 (temporarily, September 15 to October 26); Base Hospital No. 88; Hospital Unit I, which arrived on January 10, 1919, and was incorporated with Base Hospital No. 53.

One of the greatest handicaps under which the center operated was its distance from the detraining point, necessitating the transportation of all patients a distance of more than 2 miles by ambulance and truck over rough narrow roads. There never was sufficient ambulance transportation available, and the majority of patients were transported by trucks. At the time the armistice began, plans were under way providing for a railway track to be built directly into the hospital area.

Water was obtained from the Marne River. It was treated with alum for coagulation, and then with free chlorine. Because of the heavy pollution, it was necessary to chlorinate again in Lyster bags all water used for drinking purposes.

The sewerage system handled only liquids, which passed through a septic tank, and after purification were discharged into a branch of the Marne River. The bucket system latrines were in operation and proved fairly satisfactory. One Horsefall destructor was installed. This proved effective, but proved rather expensive in the matter of fuel. One steam sterilizer was adequate for all the work for the center.

^a The statements of fact appearing herein are based on the "History of the Langres hospital center," prepared under the direction of the commanding officer by members of his staff. The material used by these officers in the compilation of the history comprised official reports from the various divisions of the hospital center. The history is on file in the Historical Division, S. G. O.—Ed.

CONVALESCENT CAMP

The camp consisted of 72 marquee tents and 17 portable wooden barracks. The patients were classified and divided into several grades, according to physical strength, and were given graduated exercises, drills, and walks.

The American Red Cross constructed a large hut where amusements in the form of motion pictures, athletic exhibitions, and games were held. During its three months' existence the camp received about 3,500 patients.

DISCONTINUANCE

On January 13, 1919, Base Hospital No. 88 was ordered to Savenay, leaving only one base hospital in the center. As the central administrative staff was no longer necessary, it was discontinued on January 22, 1919.

COMMANDING OFFICER

Col. William R. Davis, M. C., August 27, 1918, to November 21, 1918.

Col. Conrad E. Koeper, M. C., November 22, 1918, to January 22, 1919.

HOSPITAL CENTER, LIMOGES¹

The hospital center at Limoges was organized July 22, 1918. Several hotels, schools, and other buildings were leased from the French; in addition, type A barracks were constructed by the United States Engineers. The hospitals were widely separated in different parts of the city. The entire group was planned to accommodate 5,500 patients, but this number was increased so that on November 13, 1918, 9,093 beds (including the convalescent camp) were reported as available.

Three base hospital units, Nos. 13, 24, and 28, arrived and were functioning some time before the center was established. Ambulance Company No. 347 arrived September 25, 1918, and was used in the evacuation of patients. Sanitary squad No. 79 reported September 29, 1918, and performed the sanitary work in the center. During January, 1919, Evacuation Hospital No. 32 and Base Hospital No. 98 arrived, relieving Base Hospitals No. 13 and No. 28, respectively.

Laundry was handled by local contract, but facilities were inadequate and a center laundry was authorized, but due to the signing of the armistice it was never completed.

Laboratory work of the center was distributed among the three hospitals, one performing the Wassermann tests, another the survey work, and a third the paraffin section work. Each laboratory operated independently, making its own routine examinations, with the exception of meningococcus typing, which was assigned to one hospital.

Beginning December, 1918, the bed capacity of the center was gradually reduced, until on February 28, 1919, all buildings but one were returned to the French. During its activity, this group admitted 23,592 patients.

¹The statements of fact appearing herein are based on the "History of the Limoges hospital center," prepared under the direction of the commanding officer by members of his staff. The material used by these officers in the compilation of the history comprised official reports from the various divisions of the hospital center. The history is on file in the Historical Division, S. G. O.—Ed.

CONVALESCENT CAMP

The camp was opened September 21, 1918, and occupied a tract of land of about 10 acres, on which 50 tents and 12 frame buildings were erected. The initial capacity of the camp was to be 1,000 beds, but during November this was found insufficient and barracks were rented from the French Government, increasing the bed capacity to 2,200. The largest number of patients in camp at any one time was 2,165; total number cared for was 3,077.



FIG. 107.—A view of part of Limoges hospital center

The camp was operated by a section of Convalescent Company No. 5, consisting of 7 officers and 45 enlisted men. Patients were also used, especially in the offices and in the kitchen. Incorporated in the daily schedule of the camp operation were regular hours for physical exercises, drills, and outdoor games, patients being formed into graded companies which were allotted schedules based on the physical possibilities of its members. The camp was evacuated on January 2, 1919, and turned over to the Engineers on January 13.

COMMANDING OFFICER

Col. William B. Bannister, M. C.

HOSPITAL CENTER, MARS-SUR-ALLIER ⁱ

The construction of this center was authorized in the fall of 1917. It was located about 2 miles from Mars-sur-Allier and was to have a capacity of 43,000 beds, including crisis expansion and convalescent camp. This capacity was never reached. At the time of the armistice the center had 30,000 available beds.

Actual construction began in February, 1918, but at first it was comparatively slow through lack of material. The work was under the direction of United States Army Engineers. Railroad sidings ran into the center and the hospital units were grouped on either side, thus making it possible to stop the train in front of any hospital designated to receive patients. When the commanding officer of the center arrived, on July 19, 1918, two units were fairly well toward completion. After August 2, 1918, the development of the center was very rapid. Material came in by trainloads almost every day. By November 11, 14 units had been completed and were functioning; 3 were almost completed, and material was on hand for 3 other units.

The following organizations formed the center and arrived in the order named: Base Hospitals Nos. 68, 48, 35, 14, 62, 131, 123, 107, 110; Evacuation Hospitals Nos. 31 and 37. Some of these did not arrive until after the armistice began.

At first, water for the center was derived from a spring, being pumped into a large concrete tank, located at the highest point in the center. This supply was ample in the early stages of development, but when the population increased to about 10,000 it proved to be insufficient, so additional water was drawn from the Allier River, some 4 miles distant. The water from both of these sources was fairly good, but too uncertain in quality for use without chlorination.

The sewerage system disposed of only the liquid waste. The pail system was used in connection with the latrines, the pails being collected once or twice a day and their contents burned. A few of the earlier units to arrive were equipped with Horsfall incinerators, but the later units used improvised crematories which seemed to work equally as well. These crematories were fairly satisfactory, but required a great deal of fuel and were not entirely free from odor.

All laundry work was done at Nevers, the nearest city of any size. A laundry was under construction in the center when the armistice was signed.

Bread at first was obtained at Nevers. Later a bakery company established a bakery, which proved very efficient and adequately met all demands.

The headquarters of the center were organized into the following departments: Commanding officer, chief of staff, adjutant, professional staff, sanitary staff, medical supply department, quartermaster department, receiving department, evacuating department, motor transport, railway transport, personnel adjutant, central purchasing agent, signal corps, central records office, engi-

ⁱ The statements of fact appearing herein are based on the "History of The Mars-sur-Allier hospital center," prepared under the direction of the commanding officer by members of his staff. The material used by these officers in the compilation of the history comprised official reports from the various divisions of the hospital center. The history is on file in the Historical Division, S. G. O.—*Ed.*

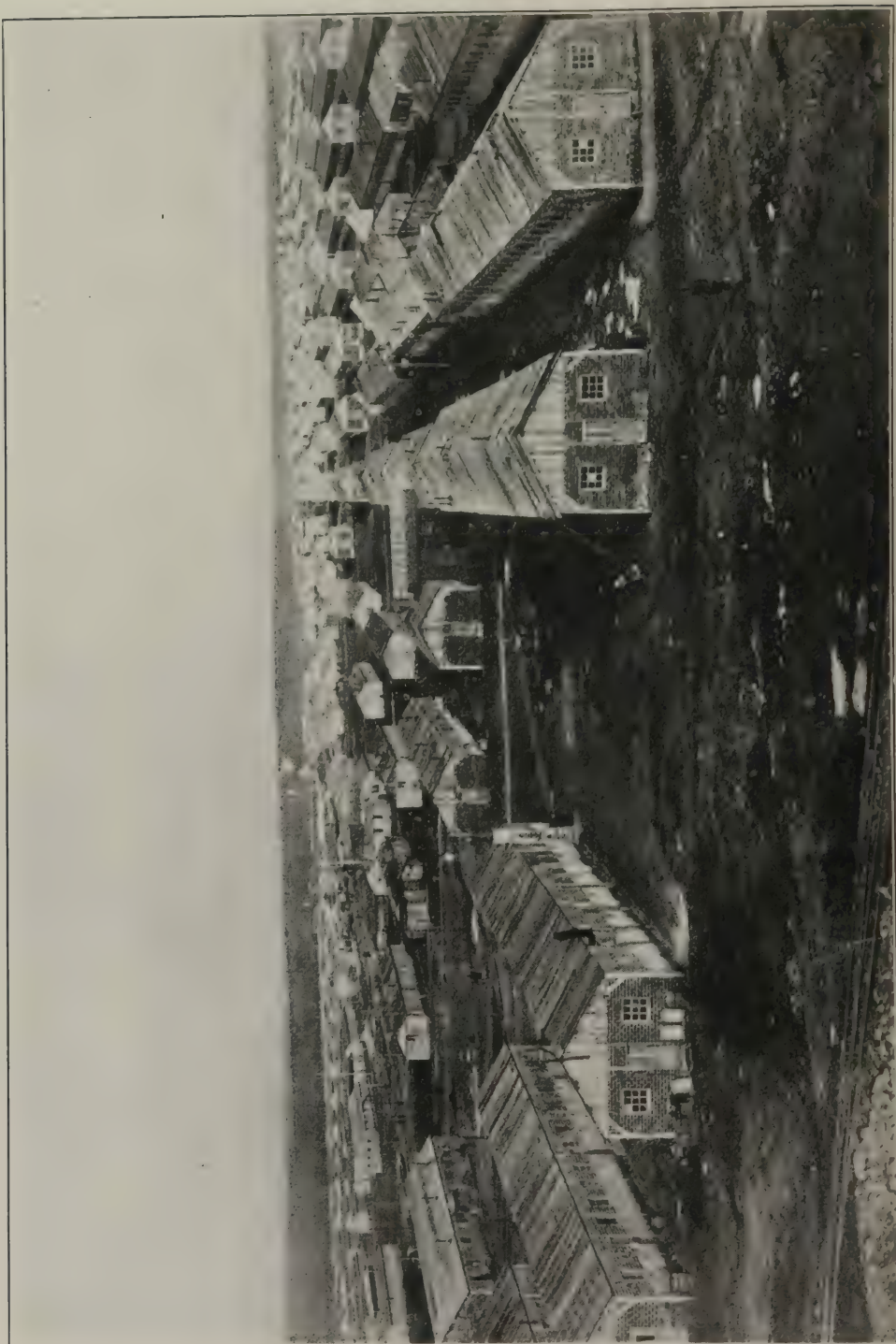


FIG. 108.— General view of Mars hospital center, looking northeast from tower at west end of center

neers, headquarters detachment and band, post office, fire department, provost marshal, welfare organization, judge advocate department, chief nurse. These departments were developed to fit the needs of various organizations, and with slight modification proved very efficient in hospital administration. As an example, the professional staff at headquarters, consisting of the surgical, medical, genitourinary, neuropsychiatric, orthopedic, X-ray, eye, ear, nose and throat, laboratory and dental consultants, were responsible for the coordination of the professional work of the center. Another important department was the central purchasing agency, a development made necessary by the large amount of supplies purchased and the tendency of independent organizations to bid against each other, thus raising the price of supplies. This was over-



FIG. 109.—One of the operating rooms, Mars hospital center

come by having all purchasing for the entire center made through one department and distributed to the various organizations as required.

The central records office was established at the beginning of the center. In this office an effort was made to keep a duplicate record of every person that came into the center. Thus it was possible within a very few moments to locate any individual in the hospital. This department was a great time-saver and proved its value as the center grew.

As frequent calls came in for operating and special teams for duty at the front, many of the hospitals were reduced to an actual minimum of working personnel. It became necessary to centralize the various departments of the hospital. The central laboratory was first to be organized, and here the bulk of laboratory work was performed, but each hospital maintained sufficient equipment to do routine urinalysis and simple blood work. Similarly the

X-ray and eye, ear, nose, and throat departments were centralized. As the center grew, it proved advisable to classify all cases and assign them to special hospitals. Some of the special hospitals were concerned largely with bone work, some with chest, and others with general medicine and surgery. A complete contagious hospital was in the process of organization when the development stopped. A central dental clinic was in active operation at the time the armistice was signed.

Prior to the influenza epidemic, in the fall of 1918, the medical service was not very active. With this epidemic, however, came a great number of pneumonia cases, with resultant complications of empyema. This made specialization of chest work necessary, and most of this surgery was handled by one unit. Each hospital maintained a contagious department of its own for each particular class of disease. One hospital cared for mumps, another for measles, another for scarlet fever, and so on. Medical cases were almost entirely confined to two hospitals. In addition to those mentioned, there was the orthopedic hospital and one for neuropsychiatric cases.

Owing to the unfamiliarity of the new personnel of the hospitals with Medical Department records, it was necessary to install some system of instructing the new organizations on these particular subjects as soon as they arrived. Two of the units were utilized as school of instruction. When a new hospital unit arrived its adjutant, registrar, mess officer, sanitary officer, senior non-commissioned officers, and clerks were distributed for instruction to one of these hospitals and remained there until they were fairly familiar with the records and their own hospitals were ready to receive patients.

All notices regarding the arrival of hospital trains were sent by telegram from regulating stations. Upon arrival of the trains the ambulant cases were removed first, all patients as a rule being taken directly to the receiving sheds of the hospital to which they had been assigned. At first, class A patients were evacuated direct to duty; later all evacuations were made from the convalescent camp.

A Red Cross hut was established at each hospital, where refreshments were served every afternoon, and practically every night some form of entertainment was given. In addition to these huts, a central theater was operated by the Red Cross.

The center organized a complete symphony orchestra of about 60 musicians, and a band of 36. It had an excellent vaudeville troupe, glee club, and several male quartets.

The convalescent camp occupied an area of about one-half mile square and comprised 100 tent units, with 301 tents (299 marquee and 2 Denry), 38 wooden buildings, 4 wooden latrine groups, 3 sheds, and 4 feces destructors. All tent units, buildings, and roads had double ditches.

Patients were admitted to this camp not only from the Mars center, but also from the Vichy center, Chatel Guyon, and Chaumont. On August 18, 1918, there were 130 patients in the camp, and on October 1 there were 1,796. This number steadily increased until the maximum of 4,565 was reached on December 5, 1918. The greatest number ever received in one day was 435. The largest evacuation was 1,336, made on December 18, 1918. Up to January 1, 1919, 11,497 men had been received and 9,638 evacuated.

The policing of camp was a large problem, necessitating a guard of approximately 210 men. The guard was partially armed during the day and completely so at night. An officer of the permanent personnel always acted as police officer, while the officers of the day were drawn from the convalescent line officers. The institution of formal guard mount very much improved the discipline and behavior of the guard. The center sanitary officer did not exercise jurisdiction over the sanitation of the camp, therefore a sanitary squad of from 50 to 100, headed by one of the permanent officers and assisted by a number of noncommissioned officers, was organized.

The military discipline was splendid, largely due to a greater percentage of military ceremonies and drills than usually occurs in establishments of that



FIG. 110. —View of convalescent camp (east end), looking north from water tower, Mars hospital center

nature. The camp maintained from 4 to 10 companies of convalescents, numbering from 150 to 520 each. The medical officer in charge of each company was not only responsible for the records and the health of the men, but also for their military instruction. All phases of military work were taken up, including the school of the soldier, company, battalion, and regiment, and special ceremonial formations as well.

Next to military discipline and drill there was nothing that contributed so much to the physical and mental welfare of convalescents as agreeable work. Ten shops were established, 2 tailor shops, 2 barber shops, 1 electrical-repair shop, 1 cobbler shop, 1 cot-repair shop, 1 carpenter shop, 1 disinfecting shop, and 1 sign-painting shop. When a patient was discovered who had any particular training or inclination, industrially or artistically, he was given every opportunity to work.

Athletics were encouraged in all forms, and intercompany competition in baseball and football was very keen. The convalescent camp closed on February 1, 1919. The hospital center at Mars-sur-Allier was discontinued on May 20, 1919.

COMMANDING OFFICER

Col. George A. Skinner, M. C.

HOSPITAL CENTER, MESVES ^k

CONSTRUCTION FEATURES

Construction of the Mesves hospital center, located between the villages of Mesves and Bulcy, in the Department of Nièvre, was approved by the general



FIG. 111.—A view of part of Mesves hospital center during the construction period

staff, A. E. F., in December, 1917. This site was selected because of its location on the Paris, Lyon & Mediterranean Railroad, its rolling and slightly elevated contour and its accessibility to the Loire River for water supply.

The original plan for the center embodied 10 base hospital units, each of 1,000 beds, with space for crisis tent expansion of an additional 1,000. Each unit was to consist of 55 buildings apportioned to administration, receiving and evacuating, bathhouses, quarters for personnel, recreation hall, morgue, X-ray and operating, supply storehouses, garage, and disinfection.

In July, 1918, additional plans were approved to increase the construction of this center to 20 base hospital units. These additional units were somewhat modified; the number of ward buildings was reduced by half, and each ward building made twice the size of the earlier ones.

^k The statements of fact appearing herein are based on the "History of the Mesves hospital center," prepared under the direction of the commanding officer by members of his staff. The material used by these officers in the compilation of the history comprised official reports from the various divisions of the hospital center. The history is on file in the Historical Division, S. G. O.—Ed.

The construction of the center was left to a firm of contractors in Paris, on January 31, 1918, and under the terms of the contract they were to furnish all material which could be obtained in France and all labor possible. The actual construction was to be done under the direction of an engineer officer, American Expeditionary Forces. The construction work was begun on February 7, 1918, but progressed very slowly during the first three months. In fact, so slowly, that on June 15, 1918, when the commanding officer of the center arrived, the only buildings completed were 6 wooden barracks in unit No. 10, and 5 barracks in unit No. 1, partially completed. At this time about 20 hotels and other buildings in Pouges-les-Eaus, about 11 miles from the Mesves center, were taken over by the center and converted into a base hospital.



FIG. 112.—A row of wards, Mesves hospital center, during construction period

This delay in construction was largely due to difficulties in receiving building material and transportation. A standard-gauge railroad siding was built and numerous roads were constructed throughout the center before any construction of barracks was begun. The first units to be partially completed were Nos. 1 and 5, closely followed by 6, 10, 2, 3, 4, 7, and 8. Patients began to arrive before the hospital buildings were completed, and many of these were occupied with only a floor, walls, and a roof; there were no windows, doors, plumbing, lighting, and heating facilities. However, they served the purpose of shelter, which was a point of paramount importance. During the last six months of 1918 the construction work progressed fairly satisfactorily, and by December 1 the first half of the center was practically 100 per cent completed, and in the second half, units 15, 16, 12, 13, and 11 were partially completed, were occupied, and cared for a full quota of patients. The construction of the five remaining units was stopped with the signing of the armistice.

The water supply at first was obtained from a well, which soon dried, necessitating the use of water from the highly contaminated Mazon Creek, which required the utmost care and supervision as to proper chlorination before using. This continued until the latter part of October, 1918, when the supply was augmented from the Loire River. In the latter part of November all water was supplied by the pumping station on the Loire, with chlorination at the source.

The sewerage system emptied into a clarification tank, constructed of reinforced concrete, on the banks of the Loire about 2 miles from the center. The construction of the sewerage system was very slow, and it was late in



FIG. 113.—Rock quarry, used in construction of Mesves hospital center

November before any of the units in the first half of the center had sewerage connections.

The latrines of the center were operated on the pail system. Five Horsfall destructors and a central destructor were in operation until January, 1919, when each hospital unit was supplied with a brick feces destructor. Some garbage and wastes were disposed of by contract to civilians; the remainder being destroyed in the central destructor. Later a type A hospital incinerator was constructed in each unit.

At first only one disinfecter, American Sterilizer Co. type, was available; however, in August, 1918, two Thresh disinfectors were received, and these by constant use took care of all disinfections. In December there were 4 portable and 4 Thresh disinfectors in use.

The lighting system consisted of two 25-kilowatt General Electric sets and one 50-kilovolt-ampere steam-driven plant. A permanent lighting system

was installed December 10, 1918, furnishing current of 110 volts to all buildings throughout the center and 220 volts to X-ray and operating buildings.

UNITS

On June 15, 1918, the commanding officer of the center arrived. On June 23 the crew of Hospital Train Unit No. 26, consisting of 2 officers and 31 enlisted men, arrived, and were immediately assigned to work on unit 1, making it ready for the reception of patients. On June 26, 6 officers and 60 enlisted men, comprising Convalescent Hospital Unit No. 2, arrived at Pougues-les-Eaux and were assigned to the newly leased hotels at that place. On this date Convalescent Depot Unit No. 1 (the only one ever organized), consisting of 2 officers and 5 enlisted men, also arrived. This constituted the Medical Department personnel until July 18, when the Sanitary Squad No. 2, consisting of 1 officer and 26 men, reported for duty. On the 23d the crew of Hospital Train Unit No. 35 arrived.

The following organizations constituted the Mesves Hospital Center:

MEDICAL

Sanitary Squad No. 44.
Sanitary Squad No. 50.
Sanitary Squad No. 78.
Sanitary Squad No. 80.
Hospital Train Unit No. 35.
Provisional Base Hospital Unit No. 3.
Provisional Base Hospital Unit No. 8.
Base Hospital Unit No. 44.
Base Hospital Unit No. 50.
Base Hospital Unit No. 54.
Base Hospital Unit No. 67.
Base Hospital Unit No. 72.
Base Hospital Unit No. 86.
Base Hospital Unit No. 89.
Base Hospital Unit No. 108.
Evacuation Hospital Unit No. 24.
Evacuation Hospital Unit No. 27.
Evacuation Hospital Unit No. 29.

ENGINEERS

Detachment 109th Engineers.
Engineer Train Unit No. 109.
Detachment 521st Engineers.
Detachment 529th Engineers.
Casual Engineers Detachment.

QUARTERMASTER CORPS

Quartermaster Detachment.
Detachment Bakery Company No. 2.
Detachment Bakery Company No. 314.
Detachment Butchery Company No. 328.
Detachment Laundry Company No. 323.
Detachment Laundry Company No. 324.
Pack Train Company No. 329.

ARMY SERVICE CORPS

Administrative Labor Company No. 2.
Administrative Labor Company No. 26.
Administrative Labor Company No. 28.
Administrative Labor Company No. 90.
Administrative Labor Company No. 91.
Administrative Labor Company No. 134.
Administrative Labor Company No. 182.

MOTOR TRUCK COMPANY

Motor Truck Company No. 543.

MILITARY POLICE

Military Police Company No. 223.

ADMINISTRATION

HEADQUARTERS

The commanding officer established his headquarters in a set of buildings known as the central administration group, and from here the entire administration of the center was accomplished. The work was, as rapidly as possible, divided into departments, and an officer assigned in charge of each.

The officers composing the staff of the commanding officer and many of their assistants, were taken from the various organizations within the center. This personnel lived in buildings provided for this purpose in the administration group. The enlisted men composing the headquarters detachments were secured from various sanitary squads, hospital train units, and casualties, ordered to the center. These organizations, upon arrival, immediately lost their identity as such and were amalgamated into the headquarters detachment.

Each organization in the center was allowed absolute freedom in administering its own internal affairs, subject to existing regulations. Policies affecting the entire command were controlled by the commanding officer of the center.

SANITARY OFFICER

In addition to the center sanitary officer, each unit had a sanitary officer, who was directly accountable to his unit commander but cooperated with the center sanitary inspector. The center sanitary officer maintained a shop where sanitary appliances were made and repaired.

QUARTERMASTER

The office of the center quartermaster was established July 13, 1918, with 1 officer and 5 enlisted men. The personnel was augmented gradually until early in January, 1919, when it reached maximum strength of 500 officers and enlisted men and 600 laborers. The office eventually comprised the following divisions: Personnel, finance, property, subsistence, bakery, laundry, and salvage sections, and center purchasing agency.

MEDICAL SUPPLY DEPOT

This depot was organized in August, 1918. The major portion of the medical supplies was received in carload lots from base storage stations and the larger central depots, ranging from 10 to 15 cars per day. A spur track permitted placing cars of supplies alongside the warehouse.

RAILROAD TRANSPORTATION SERVICE

This office was inaugurated on August 1, 1918. In addition to numerous clerks and messengers, an engineer, fireman, conductor, and two brakemen were added to operate the center switch engine. During its existence this office handled 3,500 cars. In addition, 86 hospital trains were handled between August 1, 1918, and January 1, 1919, and 1,600 transportation orders were issued.

MOTOR TRANSPORTATION DEPARTMENT

This department was organized in the latter part of September, 1918, when all transportation of the center was placed in a pool under direct control of the motor transport officer. The transportation consisted of 127 trucks, ambulances, and other vehicles.

RECEIVING AND EVACUATION SERVICE

On arrival of a train at the Mesves station, the center receiving and evacuating office was so notified by the railroad transportation office. Messages, stating the number and kind of cases, were sent immediately to hospitals

of the center that were to receive patients. The motor transport officer was also notified as to the number of the train and the prospective disposition of the patients in hospitals. The assignment of patients to hospitals was gauged by the kind of cases being received.

Up to January 1, 1919, 86 hospital trains arrived at the center, with a total of 31,912 patients. Seventy-two of these trains came directly from the evacuation hospitals at the front, arriving in an average time of 28 hours. In addition to these patients brought by the hospital trains, a great many convalescents and slightly sick and wounded were received from near-by hospitals. Upon arrival, patients were classified into class A, B, C, or D.

Prior to October 1, 1918, all evacuations, except class D, were made from the convalescent camp, transfers to the camp taking place informally by returning men to duty status from the hospital in which they had been treated. After October 1, all class A and permanent class C men were evacuated directly from hospitals, and class B and doubtful class C cases were sent to the convalescent camp. Class D patients were transferred to the base ports. Up to January 1, 1919, the center evacuated a total of 28,456.

MEDICAL INSPECTOR

This department was opened December 20, 1918. Its object was constructive criticism and the rendering of assistance in the various departments of hospitals. Particular attention was directed toward the administration work of the organizations.

MILITARY POLICE

As regular military police were not available, a company was formed from class A patients, and an officer for them was detailed from the Engineer regiment. In addition to this company a traffic police detachment was organized, consisting of 70 men under the direction of the fire marshal. The latter were employed in policing, fire prevention, and as watchmen over quartermaster and medical supply depots.

PROFESSIONAL SERVICES

MEDICAL SERVICE

The original conception of the center called for 20 hospitals, with a crisis expansion capacity for a total of 40,000 beds. Such an immense plant necessarily presented broad opportunities for classification of cases, and although but little over half the number of patients originally intended were sent there, the scheme of differentiation of the medical cases was maintained throughout. The patients with pneumonia and severe infectious diseases were sent to specified units; patients with influenza, gastrointestinal diseases, and gas poisoning to another group, while in a third group the slightly ill were collected.

The distinctively influenza hospitals were cubicled. When shortage of sheets was imminent, newspapers were employed most usefully to replace them. Isolation was carried out, and incipient cases of pneumonia were transferred promptly to the near-by pneumonia units.

The usual group of contagious diseases was divided between two hospitals. Diphtheria, scarlet fever, measles, and mumps were treated in one, and epidemic

meningitis and typhoid fever in another. The grouping of other diseases gradually took place.

An organization for control of diseases at the hospital center at Mesves was a board consisting of the chiefs of medical and laboratory services and the sanitary inspector, who met informally from time to time and devised preventive measures, as required.

OPHTHALMOLOGY AND OTOLARYNGOLOGY

A consultant in otolaryngology was appointed in October, 1918. Each hospital in the center had on its staff a qualified specialist in these branches, who cared for the cases within his own unit.

MAXILLOFACIAL SURGERY

In October, 1918, a consultant for the center was appointed. He had direct supervision over all maxillofacial cases and determined whether or not the personnel of the hospital where these cases were under treatment was capable in every way to care for them, and ordered the transfer of any cases that needed special care to the unit particularly designed for that purpose. A central dental laboratory was established and operated under the direction of the consultant. All available material and apparatus for the construction of splints and appliances was grouped in this laboratory.

ORTHOPEDIC SERVICE

A consultant in orthopedic surgery for the center was appointed the latter part of August, 1918. At this time two hospitals were selected for the reception of orthopedic cases, but later it proved necessary to take over certain wards in all other hospitals. The admission of fracture and joint cases was so great in October that it became necessary to establish 16 fracture wards in various hospitals. Owing to the fact that it was necessary to change dressings on all these cases on admission, it was impossible for the ward surgeon to adjust splints, erect Balkan frames, and apply extensions, so a splint team was organized, consisting of 1 medical officer, 1 sergeant, and 1 private. As soon as a ward began receiving orthopedic patients this team was set to work erecting frames and suspending the cases. Usually this work would be done for all the urgent cases in a day.

In a latter part of October a curative workshop combined with a splint shop was opened. During its existence 658 special splints were manufactured. At this time six reconstruction aids in physiotherapy arrived and were assigned to duty in the fracture wards.

LABORATORY SERVICE

The center laboratory was opened August 3, 1918, its work being outlined as follows: (1) Special pathology (gross and microscopic); (2) special bacteriology (pneumococcus typing, typhoid and dysentery); (3) serology (agglutination and complement fixation reactions); (4) general board of health for center (water analysis, carrier work); (5) preparation of media, purchase and requisition of supplies.

All laboratory supplies arriving in the center (except those of Base Hospital No. 44, at Pougues-les-Eaux) were invoiced to the central laboratory officer and issued by him on memorandum receipts to the several unit laboratories.

CONVALESCENT CAMP

On July 17, 1918, a temporary convalescent camp was established in the crisis expansion tents of one of the base hospital units. The first convalescent patients were received on July 19. The construction of the permanent convalescent camp began on July 28, near Buley, northeast of the center. The camp was occupied on August 7, before any of the permanent buildings were completed.

The personnel at this time consisted of commanding officer, adjutant, mess and supply officers, 2 medical officers, commanding companies, 1 convalescent line officer, and 35 men from Hospital Train Unit No. 35. By August 30, there were 1,030 convalescents in camp, and 131 tents had been erected, each accommodating 16 men on cots. The administration building, officers' quarters, and mess and kitchens were partially completed and occupied. On September 19, Convalescent Camp Unit No. 4, consisting of 9 officers and 90 men, arrived, and the patients, now numbering 1,800, were organized into 6 companies. One medical officer was assigned to each company.

Admission and evacuation to the camp occurred almost daily, the admissions always being larger, leaving an increasing balance in camp, until November 10, 1918, when the greatest number (2,859) was reached.

THE AMERICAN RED CROSS

In the early days the work of this organization consisted of distribution of extra comforts in the wards, letter writing for patients, and searching work. Later, 10 recreation halls were opened, equipped with stages, furniture, and canteens. In addition to these, an especially large hall was equipped at the convalescent camp. Also, halls were opened for the Red Cross personnel, nurses, and others. Daily entertainments were furnished by six moving-picture machines and various theatrical productions.

YOUNG MEN'S CHRISTIAN ASSOCIATION

The Young Men's Christian Association provided a number of lectures, musicians, and vaudeville artists. Baseball outfits, footballs, and basket balls were also furnished.

CLOSURE

The center ceased operating in April, 1919, and was closed in May, 1919.

COMMANDING OFFICER

Col. Henry C. Maddox, M. C., June 15, 1918, to August 16, 1918.

Col. William H. Moncrief, M. C., August 17, 1918, to January 30, 1919.

Col. Guy V. Rukke, M. C., January 31, 1919, to closure of center.

HOSPITAL CENTER, NANTES ¹

The hospital center at Nantes was organized July 29, 1918, at Doulon, a suburb of Nantes. One base hospital unit (No. 34) was located at Nantes, about 3 miles from the center proper. The group originally consisted of three

¹ The statements of fact appearing herein are based on the "History of the Nantes hospital center," prepared under the direction of the commanding officer by members of his staff. The material used by these officers in the compilation of the history comprised official reports from the various divisions of the hospital center. The history is on file in the Historical Division, S. G. O.—*Ed.*

base hospitals, Nos. 34, 38, and 11, and to these, on November 2, 1918, was added Base Hospital No. 216, which had been organized from personnel in the center. During January, 1919, Evacuation Hospitals Nos. 36, 31, and 28 relieved the three original base hospitals. In addition to the above units, the following organizations served in the center: Sanitary Squads Nos. 39 and 59 and Ambulance Company No. 346.

Water was obtained through the city of Nantes from the River Loire, and proved to be of good quality. Sewage was emptied into the River Loire, after having first passed through a septic tank. Waste material was disposed of in two type A incinerators constructed by the engineers.

The laundry at first was handled by contract, but as this proved unsatisfactory, small hand laundries were installed in each unit and operated by civilian laundresses.

ADMINISTRATION

The headquarters staff comprised the following divisions: Adjutant, quartermaster, sanitary inspector, evacuating officer, laboratory officer, fire marshal, medical supply officer, and guard officer. The commanding officer in no way interfered with the internal administration of the units; his relations with the hospitals concerned chiefly matters which were outside the jurisdiction of the hospital commanders. The office of the group quartermaster was established on August 15, 1918, and a subsistence and sales commissary on October 15. Supplies were easily procured as the quartermaster depot of base section No. 1 was within 4 miles of the center, and all requisitions were promptly filled. The medical supply depot was not fully established until October 15, 1918. Supplies were usually received from intermediate medical depot No. 2, Gievres, and base medical storage depot, St. Nazaire. The center laboratory occupied a type A barracks and a subsidiary laboratory building, 20 by 40 feet. The addition, connected with the main laboratory building, contained an ice chest and autopsy and tissue rooms.

The duties of the evacuating officer comprised: (1) Receiving all patients arriving at the hospital center, and by the use of bed reports from the various hospitals directing them to the proper hospitals for admission; (2) file and rendition of reports showing the number and nature of cases of patients in the various classes in the center; (3) receiving and executing through the unit evacuating officers, the regulations and orders relative to the evacuation or final disposition of all cases.

Prior to the arrival of a hospital train the evacuating officer was invariably notified by telegram or telephone. Sixteen ambulances were kept available at the center for the evacuation of patients from hospital trains. These trains were sidetracked at the Doulon station, less than five minutes' drive from the center. The patients on arrival at receiving wards were served hot chocolate and other nourishments by the American Red Cross.

Evacuations to the United States were made through one hospital unit (Base Hospital No. 216) which was designated as the embarkation or evacuation hospital for the center. Certain wards of that unit were set aside as embarkation wards, and an embarkation office was opened, in charge of an officer, assisted by an experienced clerical force. Each day this office notified

the various hospitals of the center the exact number of patients expected from them on the following day. Before transfer to the embarkation department these cases were paid, their records completed, they were equipped as for transfer to any other hospital, furnished with wound and service chevrons and certified as free from venereal or contagious diseases and vermin. Upon admission to the embarkation department, they were organized immediately into convalescent detachments of 50 or more, all their records checked and corrected, their money exchanged for United States currency, and the passenger lists prepared.

Upon receipt of requisition for convoy of certain numbers of patients the center evacuating officer made arrangements with the local railway transport officer as to the hour of loading, necessary baggage cars, etc., and also notified the local representative of the inspector general's office of the number of patients to be evacuated and the time that patients' records and equipment would be ready for final inspection, which was held not more than 24 hours prior to entraining. After the final inspection, detachment commanders receipted to the evacuation officer for the patient's records and equipment, and patients were again checked on board the hospital train by passenger lists.

CONVALESCENT CAMP

The camp was opened on November 7, 1918, and was operated by Convalescent Company No. 5. Seventy-two marquee tents, with a bed capacity of 1,000, were provided for the housing of patients. The camp functioned from November 7, 1918, to January 9, 1919, during which time it admitted approximately 1,500 patients. About 30 per cent of these were restored to class A and returned to their organization.

CLOSURE

The hospital center was abandoned and ceased to function on June 8, 1919.

COMMANDING OFFICER

Col. Thomas J. Kirkpatrick, M. C., July 29, 1918, to March 16, 1919.

Col. Ralph C. DeVoe, M. C., March 17, 1918, to June 8, 1919.

HOSPITAL CENTER, PAU ^m

A hospital center at Pau was authorized on September 3, 1918. It was planned that this would be located in hotel buildings in several widely separated towns in the Department of Basses-Pyrenees, near the Spanish border. Nearly a month was required for inspection of the properties offered by the French, and not until October 16, 1918, were headquarters of the center opened at Pau. Personnel and supplies had begun to arrive at the time the armistice was signed.

Four hospitals reported to the center during December, 1918. These were located as follows: Base Hospital No. 71, Pau; Base Hospital No. 98, Lourdes; Evacuation Hospital No. 20, Dax; Evacuation Hospital No. 29, Bagneres-de-

^m The statements of fact appearing herein are based on the "History of the Pau hospital center," prepared under the direction of the commanding officer by members of his staff. The material used by these officers in the compilation of the history comprised official reports from the various divisions of the hospital center. The history is on file in the Historical Division, S. G. O.—*Ed.*

Bigorre. These hospitals never functioned, as orders were received on December 30, 1918, to abandon the center and the various organizations were ordered to other stations.

COMMANDING OFFICER

Col. Adam E. Schlanser, M. C.

HOSPITAL CENTER, PERIGUEUX ⁿ

The hospital center at Perigueux was located in the valley of the Isle River on both its banks, about 1½ miles above the city of Perigueux and about 90 miles east of Bordeaux. The center was organized on September 16, 1918, and the following organizations were attached: Base Hospital No. 84, Base Hospital No. 95, Administrative Labor Companies Nos. 147 and 148, Motor Truck Company No. 523, Sanitary Squad No. 75, Regimental Band, 136th Infantry, Bakery Company No. 316, and half of Convalescent Company No. 12.

The roads in the neighborhood of this center were excellent. Buildings occupied consisted of new construction distributed according to the type A plan for base hospitals. Construction was of concrete throughout except nurses' and enlisted men's barracks, which were built of wood. Five units were planned for this group, two on the south side and three on the north side of the river, but only the two units on the south side of the river were completed and occupied when hostilities ceased.

Water was obtained from the Perigueux city supply, and was chlorinated at the pumping station, two enlisted men being stationed at the pumping station to supervise chlorinating the apparatus. In general the supply of water was abundant, though occasionally difficulty was experienced for a few days at a time. Separate lavatories and baths were provided for patients, personnel, officers, and nurses connected with the sewerage system through a septic tank. Garbage was readily disposed of to farmers, but it was found more profitable to buy pigs and feed them the garbage. Two Horsfall destructors were erected. They proved ample and satisfactory and were economical of fuel.

The operating pavilion was heated by steam; all other buildings were heated by stoves. Coal was shipped from Bordeaux and there never was a shortage. Wood was also provided in sufficient amount. Until November 20, 1918, all electricity was furnished by a local generator and after that date, from the city supply.

The various messes of the center were coordinated under the management of a center mess officer. This permitted various economies and a more intelligent use and division of the supplies which were obtained by the quartermaster from Bordeaux. A central butcher shop was installed from which all organizations drew their meat, properly cut. A bakery company was established in tents and made excellent bread. After this organization left, the source of bread supply was Bordeaux, but this was not dependable. A laundry was constructed early, but machinery was not obtained until after the armistice

ⁿ The statements of fact appearing herein are based on the "History of the Perigueux hospital center," prepared under the direction of the commanding officer by members of his staff. The material used by these officers in the compilation of the history comprised official reports from the various divisions of the hospital center. The history is on file in the Historical Division, S. G. O.—*Ed.*

began. Until then it was necessary to send laundry to the Beau Desert hospital center in trucks and ambulances, a circumstance which did not allow frequent changes of linen.

The first hospital train arrived October 18, 1918, and up to March 1, 1919, 4,558 patients were received from 9 trains. Early in January the center was designated as an orthopedic center, and 10 orthopedic surgeons reported for duty. Evacuations were made by Hospital Train No. 68 to the Beau Desert hospital center. This group was discontinued in May, 1919.

COMMANDING OFFICER

Col. Edward G. Huber, M. C.

HOSPITAL CENTER, RIMAUCOURT *

The hospital center located at Rimaucourt, Haute-Marne, occupied new structures consisting of five type A base hospital plants, supplemented by buildings to house the center staff. A railroad spur of three tracks was built into the center, and hospital units were aligned along both sides of this spur.

The normal bed capacity of the wards was 5,000, but by erection of Marquee tents this was more than doubled. On November 11, 1918, the center reported 10,338 available beds for patients and 1,675 personnel. A convalescent camp and five additional sections were under construction when hostilities ceased.

The water supply was excellent and ample. A 50,000-gallon reservoir was built on a cliff about 1,000 yards from the camp, and two electric engines pumped all the water that could be used. A system of plumbing conducted this supply into nearly every building of the group.

A sewer system emptied all kitchen and bath wastes into a canal about 2,000 yards distant. Bucket type latrines were used in connection with Horsfall incinerators.

Electricity for illumination was obtained from a local French plant, supplemented by a small gas-operated electric machine that was provided for each unit.

One bakery capable of baking for 20,000 men and one laundry able to care for a like number were also provided.

The following organizations composed the center: Base Hospitals Nos. 52, 58, 59, 64, 238; detachments, Quartermaster Corps, bakery company, butchery company, laundry company, Motor Transport Corps, and labor battalion.

The headquarters were organized into administrative and professional staffs. The administrative staff consisted of the adjutant, quartermaster, medical supply officer, sanitary officer, assistant provost marshal, post-office officer, food conservation and kitchen technique officer, and railway transport officer.

The professional staff consisted of a staff consultant, consultants in general surgery, neurosurgery, orthopedics, oroplasty, urology, ophthalmology,

* The statements of fact appearing herein are based on the "History of the Rimaucourt hospital center," prepared under the direction of the commanding officer by members of his staff. The material used by these officers in the compilation of the history comprised official reports from the various divisions of the hospital center. The history is on file in the Historical Division, S. G. O.—Ed.

otolaryngology, X ray, dentistry, neuropsychiatry, dermatology, laboratory, and pathology. The staff consultant had no administrative power. His duties were (1) to coordinate with the visiting consultants and to present his recommendations to the center commander; (2) to advise and keep the center commander informed about every professional question and to act as his medical inspector; (3) to advise changes in personnel so as to group specialists where their services were needed, and to report any excess of personnel; (4) to arrange through base hospital commanders, by mutual consent, such transfer of patients and personnel as might be desirable without the necessity of issuing orders to accomplish this result. Upon receipt of notification of the arrival of a hospital train, the staff consultant requested all hospital commanders to require such officers as were desired to report to him for orders. The staff consultant and evacuation officer then decided where to "spot" the train and gave necessary instructions to the rail transportation officer. As soon as the train arrived the staff consultant assigned to each of three or more cars, suitable teams of medical officers. These officers decided to which hospital each patient was to be sent and gave him a slip of paper bearing that number. The litter-bearer section followed the officers and evacuated the train. Walking cases were not permitted to walk from the train to the hospitals, but were transported in trucks.

Each commander of a base hospital kept two wards open for receiving purposes. All beds in these wards were cubicled and all persons on duty therein wore masks. As soon as admissions began, the surgeons in these wards began the secondary triage, sending to the registrar and the disinfecting station all cases ready for final disposition. At this triage, if it was found, for example, that a man had been admitted to the respiratory infection hospital when he should have been admitted to the gas hospital, the staff consultant was notified and transfer was effected.

The number of patients admitted to the center from date of opening on September 14, 1918, to January 28, 1919, was 18,308. The center was discontinued in May, 1919.

COMMANDING OFFICER

Col. Henry Page, M. C.

HOSPITAL CENTER, RIVIERA ^p

The origin of the Riviera hospital center was an urgent need for a location for hospitals that would give the maximum hours of sunshine and clear skies, even temperature, and the most stimulating atmospheric conditions within practicable distance of the advanced areas. This was found in that strip of coast line extending from Marseille to Menton, called the Cote d'Azur, or Riviera, about 180 miles in extent, 5 to 10 miles in depth, facing the Mediterranean Sea and sheltered by the Maritime Alps. Rainfall was limited and the climate mild rather than hot. Aerial bacteriology was low and the general atmospheric condition partook of the mingling of marine and mountain air. It

^p The statements of fact appearing herein are based on the "History of the Riviera hospital center," prepared under the direction of the commanding officer by members of his staff. The material used by these officers in the compilation of the history comprised official reports from the various divisions of the hospital center. The history is on file in the Historical Division, S. G. O.—*Ed.*

was too far from the scene of active operations to receive cases of recent injuries or acute illness, and therefore all cases received were patients who had so far recovered as to be able to stand a long journey. The center comprised all the hospitals along the north coast of the Mediterranean from Toulon to the Italian border, and functioned as a group of convalescent hospitals. The number of these hospitals was 29.

The hospitals established by the American Expeditionary Forces were located at Tamaris, Hyeres, St. Raphael, Cannes, Nice, Cap d'Ail, and Menton. In each of these places commodious hotels were leased and changed to hospitals fully equipped as regards both personnel and furnishings for the accomplishment of the most modern work in medicine and surgery. A certain number of acute medical and surgical cases developed among those who were on leave or stationed in the area, and hospital equipment took cognizance of that fact. All hospitals were established in hotels and no new construction was attempted. Garage and warehouses were rented for purposes of supply.

Acquisition of hotel properties began in July, 1918. By September 1, accommodations for 9,000 beds had been secured and by November 1, 1918, 12,000. On November 11, requests for locations for 6,000 other beds which previously had been made were canceled.

The geographical location of hospitals made it advisable to establish five groups, with one hospital in each group for acute medical and surgical cases, and the remainder in each group for ambulant cases requiring but little treatment or professional observation. Each group was organized as one hospital for purposes of admission, transfer and discharge, and general administration. Each building had its own personnel with a responsible administrative officer under the group commanding officer.

Group 1.—Hyerres, Department of Var (including Tamaris), consisted of 9 hotels, with a total capacity of 3,600. This group was first designated Convalescent Hospital No. 1, but on arrival of Base Hospital No. 99, on November 26, 1918, the designation was changed to that of the base hospital.

Group 2.—St. Raphael (including Agay Var) consisted of 3 hotels, with a total of 800 bed capacity. It was known as Convalescent Hospital No. 2 and was staffed by casual personnel. It opened January 4, 1919, and closed January 31, 1919.

Group 3.—Cannes (including Antiles) consisted of 5 hotels, with 1,450 beds, and was known as Convalescent Hospital No. 3. On December 22, 1918, this group was taken over by Base Hospital 93.

Group 4.—Nice (including Cap d'Ail) consisted of 3 hotels, with 2,300 beds, and was known as Convalescent Hospital No. 4.

Group 5.—Menton consisted of 9 hotels, with 2,700 beds. This group was first started with casual personnel and was known as Evacuation Hospital No. 5. From December 23, 1918, to February 13, 1919, Evacuation Hospital No. 49 operated this group. The headquarters of the entire center were located at Cannes, A. M., the organization being as follows: Commanding officer, adjutant, personnel adjutant, urologist, historian, medical supply officer, group supply officer, and motor transport officer.

The records of the Riviera center embodied the daily, weekly, monthly, and quarterly reports received from each unit commander throughout the center. Reports were transmitted daily by the various units by a system of couriers on motor cycles. This system, in conjunction with the telephone and telegraph, was the main factor in the administrative control of the area and made it into a compact unit, reducing the 220 km. which separated the farthest situated groups from each other into a center linking all the groups together. Under its efficient service the great distances were minimized, and daily contact was maintained by headquarters with each group and by all groups with one another.



FIG. 114.—Base Hospital No. 99, Hyeres, Riviera hospital center

Patients were received from November 7, 1918, to April 1, 1919, a total of 13,975 cases being admitted during this period. Patients were classified by a disability board appointed for each unit by the commanding officer of the center. Hospital trains were provided for transporting discharged patients. Those for home ports were shipped direct to embarkation ports, others to duty or special hospitals, as the case called for.

The exercise and training of men partially disabled through wounds received in battle were under the supervision of the commanding officers of the various units. Voluntary movements were insisted upon, which, with the aid of massage and use of electrical instruments, greatly aided in restoring parts, the use of which would have otherwise been lost.

Railroad transportation officers were assigned to Hyeres, Cannes, and Nice on December 15, 1918, and handled all transportation for the personnel, patients, and supplies for the hospitals. Men from the different rail transportation offices met the incoming and outgoing trains and did all that was possible to assist members of the American Expeditionary Forces while traveling on the Riviera. Practically all patients were handled on regular United States Army hospital trains. Thirty-four of these trains arrived during the period the center was open. These trains parked at La Bocca, just west of Cannes, where they were resupplied. When receiving patients, they were "spotted" at Cannes, and patients from Menton and Nice were transferred



FIG. 115.—Base Hospital No. 93, Cannes, Riviera hospital center

to that place for evacuation. The trains for Base Hospital No. 99 were switched at Toulon and "spotted" directly to Hyeres.

Medical supplies for the center were received on requisition from the supply depot at Cosne, Maramis, and the depot of base section No. 3. At first, because of congestion of railroad transportation, supplies were often delayed (the opening of this center had been delayed by inability to procure supplies), but in February, 1919, a medical supply depot was established at Cannes, and thereafter local requisitions of hospitals were filled promptly.

The Quartermaster Department began to function on October 29, 1918, with headquarters at Cannes. A suitable warehouse was leased at the latter place and a depot established. Later, four subdepots were established for the needs of the entire hospital center. At the beginning of the center the quarter-

master operated the post office and railway transportation until these activities increased to such a great extent that a regular post office and a rail transportation office were established. Repairs and improvements to hotels were made under the engineer officer.

The American Red Cross attached workers to all the groups, where they promoted the welfare of all persons in the center.

After November 11, 1918, properties were gradually returned to their owners or made into accommodations for leave areas. No patients were received after April 1, 1919, and evacuation began May 1, 1919, the personnel leaving the whole area June 1, 1919.



FIG. 116.—Evacuation Hospital No. 49, Menton, Riviera hospital center

COMMANDING OFFICER

Col. Haywood S. Hansell, M. C., September 12, 1918, to April 28, 1919.

Lieut. Col. Leopold Mitchell, M. C., April 29, 1919, to June 2, 1919.

HOSPITAL CENTER, SAVENAY ^a

The hospital center of Savenay was located in the city of that name, about 18 miles northeast of St. Nazaire. Its construction was authorized by the commander in chief in February, 1918, and was to consist of 15 type A base hospital units and 1 base hospital in the normal school of Savenay, which had

^a The statements of fact appearing herein are based on the "History of the Savenay hospital center," prepared under the direction of the commanding officer by members of his staff. The material used by these officers in the compilation of the history comprised official reports from the various divisions of the hospital center. The history is on file in the Historical Division, S. G. O.—Ed.

been in operation since August 21, 1917. A convalescent camp, the so-called type C hospital, was also authorized, with a capacity of 5,200 beds. The center was organized on August 5, 1918, when the commanding officer of Base Hospital No. 8 was also appointed commanding officer of the Savenay center. On that date his staff consisted of an adjutant, quartermaster, evacuating officer, and a sanitary officer. Later the organization of the center headquarters was as follows: Commanding officer, executive officer, adjutant's department (2 assistant adjutants), evacuation officer (1 assistant), receiving officer (2 assistants), personnel adjutant (1 assistant), service record division, inspector (3 assistants), maintenance officer, sanitary inspector (4 assistants), center laboratory officer (3 assistants), medical supply officer (1 assistant), motor transport officer, hospital train replenishment depot, orthopedic consultant (2 assistants), dental supervisor, historical officer, athletic director,



FIG. 117.—Airplane view, Savenay hospital center

entertainment director, disability board, quartermaster (8 assistants). Adequate elements of the center staff were kept on duty during the night so that there was no interruption of its central service.

The following Medical Department units formed the center: Base Hospitals Nos. 8, 29, 88, 100, 113, 118, 119, 214, Hospital Unit F, field hospital company, Ambulance Company No. 345, 87th Division. The eventual capacity of the center was to be 25,000 beds. This program was never fully realized because of the termination of hostilities.

All the unit buildings which were built by the United States Engineers consisted of demountable sectional barracks and plaster-block structures. To build and maintain the unit shops were established, a garage, stable, and two large freight yards were built. Several miles of standard-gauge track were

constructed and spur tracks laid to connect the various units of the center. About a mile and a half of roads were built in the units. Each unit was connected by telephone with a central exchange, installed by the Signal Corps.

Electric power was obtained from a French producer at St. Nazaire. Each unit of 1,000 beds had a 50-kilowatt capacity, the convalescent camp 25-kilowatt, and the tuberculosis camp 5.

During the early days of the center most of its important work was carried on by Base Hospital No. 8, which was the first unit assigned to this center. As each new hospital unit was constructed and made ready for patients, it was given a number as a unit of Base Hospital No. 8, and its activities were carried on that hospital's records until personnel of a base hospital arrived from the United States to continue its functions. Thus, when a new unit reported for duty it was assigned to take over some provisional hospital already operated by Base Hospital No. 8.

The shortage of water was very serious until a dam was constructed. This dam, of reinforced concrete, was built across a small valley between two hills, forming a reservoir, which had a total capacity of about 140,000,000 gallons. It was completed April 10, 1918. An additional reservoir was planned and built, but due to the signing of the armistice was never used.

Sewerage for the service of three units was taken care of by an Imhoff type tank. In the units not having sewerage connections the contents of latrine pails were collected each day in cans by prisoners of war, and carried by truck to a gravel pit.

Clothing and equipage were difficult to obtain during active operation, but after the armistice this shortage was relieved. An excellent laundry was in operation, which averaged 450,000 pieces of laundry per month. A modern bakery was constructed which supplied all bread for the center. From October, 1918, to March, 1919, this bakery produced 5,094,438 pounds of bread.

The medical supply depot was instituted on September 12, 1918. This organization completely equipped and maintained all the hospital units in the center, served as a base of supply for all hospital trains entering that area, and furnished medical supplies for prisoner of war companies and engineers doing duty near the center.

The location of Savenay, within one hour by rail of the port of St. Nazaire, and only seven hours from Brest, made it particularly important as an evacuation center.

The problem of receiving and admitting patients to the hospitals of this center was at first handled by a receiving officer from each hospital in rotation, each assuming the work for a definite period of one or two days, and then being succeeded by the receiving officer of the hospital next on the list. Since the functions of certain of the hospitals of this center were of a special character (e. g., Base Hospital No. 88 cared for all venereal cases, Base Hospital No. 118 all cases of tuberculosis, and Base Hospital No. 69 the very seriously wounded litter cases), it was always necessary that a classification of the patients be made upon arrival of each hospital train. A more satisfactory system was finally developed when a center receiving officer, with 2 junior officers and 8 enlisted men, was appointed. The receiving officer met the incoming trains, with such

a number of men that one could be assigned to each car. The receiving officer went through the train, inspected the field medical card of each patient, and decided to which hospital he should be sent. With the officer a sergeant was in attendance, carrying a box of tags of various colors, each color representing a different hospital. When the officer decided to which hospital a patient should be assigned, the sergeant tagged him accordingly.

While this work was going on, the men assigned to the several cars of the train made a nominal list of every patient, showing rank, serial number, diagnosis, hospital of origin, and hospital to which assigned at Savenay. These lists were then turned in to the records office of the hospital center in order that admission cards might be made for file and other purposes of record. The greater percentage of patients arriving at the Savenay hospital center came on hospital trains, but there was always a certain number coming by way of trench trains of the regular passenger service type, and also some who came by motor transportation. Also some were admitted from the personnel of the center. All of these patients, no matter from what route admitted, were required to pass through the center receiving office in order that they might properly be classified and assigned, and in order that record might be made of their admission in the center records office.

Each hospital of the center also maintained its own receiving office, but the receiving officer of any of these hospitals was not allowed to accept a patient until he had been through the regular channel of the center receiving office.

In the early days of the hospital center, all evacuations made from Savenay were handled through Base Hospital No. 8 and passed through the records of that hospital.

Prior to November 11, 1918, all American Expeditionary Forces patients returned to the United States on surgeon's certificate of disability were evacuated through Savenay. Until that date efforts of the Medical Department were directed to sending men back to duty where possible, and large numbers of evacuations were made to the convalescent camp and from that camp back to duty.

After November 11, 1918, instructions were so modified that many patients who under previous rules would have been sent to duty in class B, were returned to the United States.

The evacuation service at the hospital center, Savenay, increased after the armistice began to such an extent that the simple measure theretofore employed proved insufficient, and the work was centralized under the direction of a center evacuating officer. Each hospital, however, retained its own evacuating officer also, and the center, together with the individual units, combined to form one great evacuation hospital. The operation of the system of evacuation now adopted was as follows:

A representative of the base surgeon at St. Nazaire, or at Brest—for evacuations from Savenay were made through both of these ports—on learning that a vessel was ready for hospital service and able to accommodate a certain number of patients, would telephone to the center evacuating officer to the effect that accommodations were in readiness for a specific number of patients of certain types which he specified. He might designate, for instance, that there were

accommodations for 30 litter cases, 60 ambulatory surgical requiring dressings, 210 medical and surgical patients in standees, 590 medical and surgical cases not requiring attention, and 20 mental cases requiring restraint. The evacuation officer of the center would call upon the evacuating officers of the various hospital units telling them how many and what class of patients he would require from their respective hospitals. In order that he might know just what he reasonably could call for, a morning report was supplied by each hospital, showing the number and classes of patients ready for evacuation. From these reports the center evacuation officer would know the number and character of patients in each unit ready for evacuation.

As soon as they had received the patients, the evacuation officer of units sent the patients' records to the central evacuation office of the center, in order that passenger lists might be prepared. These lists carried the patients in consecutive numbers for the entire center, giving the quota from each hospital on a separate sheet, and showing at the head of that sheet the organization from which each patient came. It was the duty of the evacuating officer of each hospital to see that the patients whose names were sent in on the passenger lists were fully prepared ready for evacuation in every respect. In order to insure uniformity in evacuation, the following method of procedure was prescribed:

PROCEDURE OF EVACUATION OF PATIENTS FOR EMBARKATION FROM HOSPITAL CENTER,
SAVENAY

1. When the number of patients for Brest or St. Nazaire is known, the capacity blank is filled out, apportioning cases to the various hospitals according to the classified morning report of evacuable cases.

2. Determination of number of detachments of ambulatory sick and wounded.

3. Determination of number of officers and attendants needed for officers, nurses, litter cases, and mentals (not formed in detachments).

4. Requisitions:

(1) Records of patients from various hospitals (Form E-1).

(2) Detachment commanders and attendants to be furnished by personnel adjutant (Form E-4).

(3) Hospital train from regulator of hospital trains and supplies, a copy of the requisition to R. T. O., Savenay, also for baggage car (Form E-5).

(4) Requisition patients (Form E-2).

5. Record envelopes to be brought to evacuation center by evacuation officers of several hospitals, and histories and records checked at this time. Check passenger list.

6. Send copies of passenger list to various hospitals and tag patients.

(1) Duty of "taggers" from center to note any colored men tagged and not so marked on passenger list.

(2) To check patients requiring dressings, and see that they are properly tagged.

(Exception: Passenger list will be delivered to Base Hospital No. 214, but the patients are not checked or tagged by evacuation center.)

7. Submit data for special orders to orders department.

(1) Patients, officers, nurses, enlisted men.

(2) Data of attendants and detachment commanders to orders department from personnel adjutant at same time it is sent to evacuation center.

8. Notify quartermaster of several hospitals by phone and memo to commanding officers of several hospitals of number of car and place of loading baggage (Form E-3). No baggage to be loaded unless checker is present from the evacuation center.

9. Block out convoy for the several trains on block (Form E-6).

(1) Confer with commanding officer of train as to any reasons for not loading as blocked.

10. Loading of train:

(1) (a) Evacuation officers will instruct ambulatory patients before coming to evacuation center to entrain to look for the corresponding number of their little tag, on the block at each stall in the evacuation center; for example, Car A-1, Nos. A-1 to A-36. This stall would include all patients numbered A-1 up to A-37.

(b) That when they are placed in the stall, to remain there. When going aboard the train remain in the same numerical order to facilitate detraining.

(c) To remain in line and not wander about or lean on rail during inspection, but to cover off in column of twos and stand at attention while being inspected.

(d) To be quiet and orderly and assist in hastening their departure.

(e) That there will positively be no smoking while waiting to entrain.

(2) Load.

11. Record check.

(1) Pull out record envelopes of cross-offs.

(2) Correct Navy copy.

(3) Correct base surgeon's copy.

(4) Correct train commander's copy.

(5) Correct commanding officer of detachment's copy.

(6) Send 16 uncorrected copies of port personnel adjutant with memorandum of serial number of cross-offs on St. Nazaire convoy. (Send only 6 corrected copies to Brest with memorandum to commanding officer, hospital center, Kerhoun, of serial number of cross-offs.)

(7) Send memorandum to Navy officer on second train, giving serial number of cross-offs, if part of a detachment has gone on a previous train.

(8) Place aboard all records of complete detachments loaded. (If a part of a detachment is loaded, all records will go on train on which remainder of this detachment is completed.)

(9) Complete train commander's block of train.

(10) Complete detraining officer's block of train.

(11) Complete senior detachment commander's block of train.

(12) Furnish all information required by inspectors as to detachments and number of patients loaded.

12. Report to orders department exact number of cases leaving on train for telegram when convoy goes to Brest. Call Brest by telephone.

* * * * *

The work of the hospital center, instead of decreasing after the armistice began, was greatly augmented because of the closure or contraction of base hospitals farther forward and the evacuation of casualties toward base ports with a view to their return to the United States. Hospitals composing this center were therefore filled. This condition continued until the month of March, 1919, when there began to be some diminution in the number of patients. This center was in effect an evacuation hospital for the American Expeditionary Forces and cleared a much larger number of patients than did any other formation which was engaged in this service.

The following table gives the number of patients evacuated from the hospital center at Savenay, to and including July 31, 1919.

	St. Na- zaire	Brest	Bor- deaux		St. Na- zaire	Brest	Bor- deaux
1917				1918			
November.....	3			January.....	1,172	2,571	
1918				Do.....	3,531	4,205	
January.....	234			Do.....	6,410	989	
Do.....	83			1919			
Do.....	239			January.....	5,022	3,885	
Do.....	350			February.....	5,092	5,332	124
Do.....	202			March.....	4,449	6,048	
Do.....	384			April.....	4,518	4,807	
Do.....	90	692		May.....	5,019	3,578	
Do.....	35	1,590		June.....	3,140	4,731	
Do.....	510	2,680		July.....	60	251	

Grand total of 82,026 patients to the United States.

To duty and replacement through this center, 8,696.

The chief consultant of the medical service, under date of letter of June 6, organized teams for treatment of gassed cases. These were designated gas teams and consisted of 1 medical officer, 2 nurses, and 2 enlisted men. August 17 it was decided to use these permanently for treatment of surgical shock and should consist of 1 medical officer, 1 nurse, and 1 enlisted man. On September 5 this designation was changed to emergency medical teams.

Surgical teams were furnished for the front and for hospitals in the center. Infected cases were isolated in tents; also suspects and observation cases. Tent colony plan was for infected cases. Laboratory and X ray was used and many patients were returned to duty. Class D cases were evacuated to the United States. A tuberculosis camp was erected and taken over by Base Hospital No. 118, on January 25, 1919.

ORTHOPEDIC DIVISION

The designation of Savenay as a center through which all orthopedic patients must be sent from the American Expeditionary Forces to the United States had a considerable effect in determining nearly all of the activities in that specialty in this area. An orthopedic department of the surgical division was established in this center in February, 1918. At the beginning Base Hospital No. 8 was called upon to perform such hospital duties as ordinarily fell to a base hospital. In making the first response to demands for convoys to the United States, patients were evacuated in much the same way as from other base hospitals. It was soon discovered, however, that special preparation would be necessary in the case of patients with battle casualties who were to travel to the United States—that at least certain types of treatment must be given beforehand, and that certain provision must be made against discomfort and danger of complications on the way across.

Because of the character of the wounds and the condition in which patients arrived at a point as far from the front line as Savenay, it was subsequently decided by the chief surgeon that special responsibility for these patients should be given to the orthopedic department. The entire policy was not determined at once, but after about August 1, 1918, a detailed scheme was worked out in which the Savenay hospital center had a principal part. Thereafter patients received the treatment necessary and were prepared in such a way that many thousands were transferred with comfort and safety from Savenay to hospitals in the United States.

During August a more comprehensive plan than that which had been in operation theretofore for orthopedic cases was established. A change in policy with regard to classes of patients to be evacuated to the United States was inaugurated. Changes in staff were effected, and it was directed from headquarters, August 20, 1918 (Circular No. 46, office of the chief surgeon, A. E. F.), that the orthopedic department should be responsible for the surgical treatment, corrective and otherwise, of all bone and joint injuries, amputations, tendon injuries or inflammations, flat feet, spine injuries, and general bad posture. The bone and joint injuries included fractures. The orthopedic department was made responsible for the necessary treatment, but more particularly for the adjustment and splinting of all such cases, so that the patients could be transferred to the United States.

During the first two weeks under the new régime about 400 orthopedic patients had to be splinted and consigned to convoys for transfer.

One effect of this was to exhaust at once the supply of splints available in Base Hospital No. 8. Splints were almost impossible to obtain at the moment, and improvised splints and plaster of Paris had to be used. The situation was greatly ameliorated by the voluntary efforts of a number of the patients who, under the direction of two of the enlisted men of the Medical Department, made hundreds of hand cock-up splints, splints for the support of drop-foot and even the more complicated finger extension and flexion splints and airplane splints.

These splints were made mostly of wood, but the salvage department was called upon to furnish shoes and other necessities. The iron bars of mosquito-bar supports which had been condemned were converted into splints, entirely satisfactory in every way, except that they lacked the finished appearance of the usual article.

Base Hospital No. 8 now accommodated about 3,000 patients. Immediate segregation of orthopedic patients being apparently impossible, one of the first requirements of the department was a system by means of which all such patients could be located and cared for. This was undertaken both for the benefit of the patient and to avoid delay in making up passenger lists for convoys. The four features found necessary to establish in this connection were as follows: (1) The cataloguing and inspection of every orthopedic patient as he entered the hospital; (2) the written opinion of every medical officer on the patients that he saw; (3) the centralized splint and plaster-of-Paris room, to which walking patients were brought for treatment; (4) a card index catalogue with a follow-up system by which recommendations made by medical officers were checked up and controlled until the patient was pronounced fit for transfer.

The first centralized splint room or dispensary, established about September 1, 1918, proved one of the most helpful features. In the course of a few days it reached a capacity of from 30 to 50 patients daily. On one Sunday, after receiving a large convoy, over 100 patients were splinted and had plaster casts applied during the day. Walking patients principally, but also a few cot cases, were brought to the splint room from all the wards and cared for by the surgeons in attendance, as in any dispensary clinic. At this time the number of new orthopedic patients arriving at Savenay was about 70 per day.

From the beginning, patients were rechecked as they were sent to the trains leaving the hospital. Occasional defects in splinting were in this way caught up and remedied as the patients departed. After the first fortnight practically every patient in each convoy had been carefully and adequately splinted, whether for the needs of immediate treatment or for protection during the journey to the United States.

Also, by way of suggestion to medical officers and nurses into whose hands the patients passed on their way home, tags were printed and attached to the splints on the patients' departure from the hospital. The following are given as illustrations:

Tag 1, for Thomas humerus traction splints:

The arm is to be kept securely bandaged into splint at all times. Only the bandage immediately over the wound is to be removed for dressings. The hand is to be kept in supination and dorsiflexed. The elbow is to be kept at or slightly beyond a right angle.

Tag 2, for Thomas femur traction splints:

Please do not release the traction or lift the leg out of the splint for dressings. Remove bandages only immediately over the wound and keep all others and the traction tight and neat.

The exact methods employed in dealing with patients on admission may best be illustrated by quoting from a circular which was published from the headquarters of the orthopedic department October 15, 1918. The circular was published following the completion of a plan by which an extensive segregation of patients according to diagnosis had been made and the patients placed in groups in special wards. The first special wards to be provided were those for fractures of the femur and for amputations. These were provided during September. The obvious advantages of this plan led to the approval by the commanding officer early in October of a larger plan, by means of which more than 1,400 beds were set aside in Base Hospital No. 8, with special wards for leg fractures below the knee (64 beds), battle injuries of the knee-joint (32 beds), gunshot wounds and fractures of the upper extremities (256 beds), gunshot fractures of the femur (196 beds), and amputations (250 beds), etc.

The following is the plan outlined in the circular issued October 13, 1918, to be used in receiving patients:

(a) Patients will be admitted from the receiving room to wards A-1 to A-15 and to ward 5 in the following groups.

(b) No patients are to be admitted to the B wards. These will be reserved for patients who are ready for transfer to the United States.

A-1 (64 beds): Miscellaneous (for cases in regard to the diagnosis of which the receiving office is in doubt).

A-2 and 3 (98 beds): Amputation cases.

A-4 (32 beds): Knee-joint injuries.

A-5 (64 beds): All injuries of the upper extremities, including shoulder injuries.

A-10, 11, 12 (196 beds): Fractures of the femur. (Femur cases will be evacuated direct from these wards to the train.)

A-15 (64 beds): Foot injuries.

Ward No. 5: Will remain, at present, a ward for miscellaneous orthopedic cases.

On the morning following the patients' admission to Savenay, special buff cards for the orthopedic service will be distributed. They will contain the patient's name, number, unit, date of admission here, and diagnosis. They are to be completed in the manner indicated by the following:

[Sample card]

"Yes" or "No"

Name, Doe, John. Rank, Pvt.

Date, Oct. 15/18. No. 1,000,000. Unit, Co. I, 10 Inf.

Diagnosis G. S. W. left leg with F. C. C. femur and injury to sciatic nerve. (Diagnosis number) 27-31.

Condition 1, 2, 3, (4). (Notes) No splint. A. B. C, (D). Treatment: Thomas splint. (Initials of medical officer.)

Hospital: 1 2 3. B. H. 4.

Condition as to readiness for transfer is indicated by writing on the margin of the card, as follows:

"Yes," if no treatment is required and case is ready for immediate transfer.

"No," if splinting is required and case will be ready for immediate transfer after the required splinting is completed.

"No," if prolonged treatment is required to prepare case for evacuation.

Diagnosis numbers are entered in accordance with charts of diagnosis numbers already prepared (an arbitrary code).

Condition: (1) No splint required and wearing none; (2) wearing satisfactory splint; (3) wearing unsatisfactory splint; (4) wearing no splint, but needing one.

A, B, C, D: Classification as to nature of disability.

Hospital: Number of hospital through which patients have successively passed should be entered here, space (3) being for hospital from which cases have been transferred to this center. These slips must be finished and returned to the orthopedic office before noon of the same day. There must be no exceptions to this rule.

Patients admitted during the preceding 24 hours, who are found to require radical changes of splint or other application of new splints, may be sent at once or during the afternoon from 1.30 to 4.30 to the plaster of Paris and splint room, where special medical officers will be on duty to deal with them. The splint or plaster cast recommended should be indicated on the special splint prepared for this purpose and should accompany the patient. In case of doubt, regarding the exact operation or procedure to be used in the treatment of any patient, it is expected that the services of the orthopedic consultant or some one designated by him will be called for. Certain standard methods have been evolved for dealing with these conditions; but in this center, particularly with both treatment and evacuation in mind, careful judgment must be used in order that the best interests of the patients may be served.

During the period of waiting for evacuation for most of the patients and during the stay in the hospital, extensive use is to be made of the services of the reconstruction aides. Walking patients are to have exercise and massage in groups and must be sent to the orthopedic department with special notes as to treatment suggested, at certain hours, as indicated in the following schedule:

(a) Patients with median, musculospiral, and ulnar nerve injuries, 10.30 to 11.30 every morning.

(b) Patients with knee-joint injuries for knee-joint, thigh, or leg massage, 1.30 to 2.30 p. m.

(c) Patients with sciatic, external popliteal, or other nerve injuries of the lower extremities, 2.30 to 3.30 p. m.

(d) Patients with elbow injuries for forearm, hand or finger exercises, 3.30 to 4.30 p. m.

Other reconstruction aides (occupational) will be available for directing the employment of bed patients. Any note directed to the consultant in orthopedic surgery on this subject, as to dealing with the individual patients or wards as a whole will receive prompt attention.

These points with regard to the records of these patients must be strictly complied with:

(a) The admission cards must be completed before noon of the day following the patients' arrival at the hospital, and the cards must be sent to the orthopedic office.

(b) The patient's condition, when admitted, and the first recommendations must be entered the same day on the field medical card so that the field medical cards, as the patients proceed from admitting wards to the evacuating wards, will be complete in so far as Base Hospital No. 8 is concerned.

(d) The orthopedic office must be supplied at 9 o'clock each morning by the medical officer or the nurse in charge of each ward with names, identification numbers, and organizations of all patients admitted to or discharged from the wards, above mentioned, during the 24 hours up to midnight of the day preceding. Lists of the wards will be checked every morning in the orthopedic office as to whether or not these reports have been received, and the reports must be sent before 9 o'clock without fail.

The care of patients with battle injuries was always so large a problem, especially at this center, that it was important to lay aside all personal and departmental considerations. To a large extent this was so successfully accomplished that it was considered one of the principal reasons for much of the work done at Savenay.

One of the earliest, as well as one of the most important features of the orthopedic service at Base Hospital No. 8 was the installation of the amputation service. Three principal features were to be noted in the inauguration and development of this service: (1) The treatment of all unhealed stumps by skin traction devices in an effort to preserve the length of the existing stump. This plan did away immediately with many reamputations and contributed greatly to the comfort and welfare of patients with stumps that were not healing properly. (2) The organization of physical training classes. In these men were taught balancing to strengthen the remaining portions of the amputated extremities, and to protect themselves against the tendency toward contracture deformities. (3) The application of provisional artificial limbs to accomplish the immediate replacing of a man on his feet, the exercise and shrinkage of stumps, and the preparation in all other ways of the men for the permanent prosthetic device to be applied upon his return to the United States.

In undertaking to provide provisional artificial limbs for all the patients with leg amputations, the American Expeditionary Forces took an advanced position. The amputation department of Savenay hospital center undertook to apply to every man with leg amputation a provisional artificial limb before he left for the United States. Such limbs were prepared in a manner first popularized by the Belgians more than two years previously and since extensively used by the British. In American hospitals, however, these artificial limbs were fitted earlier and more universally. Ready-made devices were supplied for both above and below knee amputations. These were fitted to the stump by the construction of a plaster-of-Paris bucket. This was made on the patient himself and the mechanical devices were built into the bucket as it was applied. In the case of amputation above the knee, the artificial extremity had a crude knee joint, which enabled the man to bend the leg when he sat down. This was locked without removing the clothing when he arose from a sitting position. During September about 75 of these artificial legs were applied. About October 1, however, the number had grown to average about five a day, and in every convoy a very considerable number of men were being sent with these temporary artificial limbs, upon which they were walking very well.

During the first four weeks of the operation of the orthopedic service, 1,904 patients passed through the department. These were received from about 50 base hospitals, camp hospitals, and other medical organizations throughout France. Thirteen hundred were splint patients, of whom a few more than one thousand had splints readjusted or applied for the first time at Base Hospital No. 8. Five hundred and eighty-one had their splints applied for the first time at this hospital. Twelve hospitals sent more than 100 patients each to Base Hospital No. 8 on their way home to the United States.

Of the 1,904 patients, about 500 had wounds of the upper extremity and about 350 wounds of the lower extremity. These consisted chiefly of compound fractures, although a considerable number had wounds of the soft parts including nerve injuries without bone damage. There were about 100 with injury of the median, musculospiral, or ulnar nerves and about 50 with injuries of the sciatic and external popliteal nerves.

The conditions most commonly presenting themselves for operative or splint treatment were in general as follows: (1) Adduction deformity in upper arm and shoulder injuries; (2) fixation of the elbow, usually with the arm in extension; (3) drop-wrist in musculospiral injuries; (4) fixation of the hand and fingers, usually in extension in gun-shot wounds of the wrist and carpus; (5) femur shortening (in a number of cases as much as seven or eight cm.); (6) malunion of both femur and leg fractures; (7) drop-foot due both to nerve injuries and to leg, ankle and tarsal injuries; (8) flexion contractures of all sorts due to soft part wounds.

Separate wards, about 180 beds, for compound femur fractures and 160 for amputations were set aside. Other orthopedic conditions were treated in other wards as they came. Staff meetings of the entire surgical staff and the hearty cooperation of other departments made improvement in the care and transfer of the patients rapid and fairly easy. In the case of some of the larger convoys, surgical officers were detailed to accompany patients to their port of debarkation for the United States or even to the other side.

The attitude of the orthopedic service at Savenay hospital center toward convoys of its patients going to the United States were largely determined by the visit of the chief consultant in orthopedic surgery to certain convoys leaving Brest about the middle of August, 1918.

During September, at the request of the commanding officer of the center, one of the transports leaving St. Nazaire was visited and inspected. The following letter is a report of that visit:

AMERICAN EXPEDITIONARY FORCES,
BASE HOSPITAL No. 8,
September 15, 1918.

From: Chief of the orthopedic service.

To: The commanding officer.

Subject: Condition of patients for transfer to the United States.

Reporting on the condition of patients on board the ———, visited on your instructions this afternoon, the following is respectfully submitted:

1. Patients leaving the hospital at 10 p. m. last evening were placed on the boat between the hours of 0 and 10 this morning. Splints and apparatus were in good condition. No surgical dressings had been done since the patients left the hospital.

2. All splints had tags of instructions attached. The medical officer on the boat had deferred the surgical dressings until our arrival. He was in doubt as to the method of dealing with surgical dressings for patients in splints (samples of tag instructions are attached hereto for your information).

3. A number of the bed patients should have been dressed this morning. The ambulatory patients were all in good condition.

4. No medical officer or Hospital Corps men were found who had previous experience in dealing with this class of patients, a considerable number of whom were elaborately splinted and required daily surgical dressing. For these patients to travel in comfort and safety it is necessary that the dressings be done without disturbing the splints and that the staff of surgeons and orderlies be adequate even under unfavorable conditions.

5. It is suggested that hereafter a medical officer accompany these patients until they are on board the boats, and at least until they have had their first surgical attention. Also that arrangements be made so that in the case of larger convoys a medical officer from the hospital, with special experience in dealing with this class of patients, should accompany them to their destination.

Thereafter medical officers, one or more, were assigned to almost every convoy. During January, 1919, instructions from headquarters provided that every 150 patients must be accompanied by a medical officer in charge.

When other hospitals were located in the Savenay hospital center, the lessons that had been learned by the experiences of Base Hospital No. 8 were applied to the new organizations. Admission slips were completed in the same way. Patients were examined promptly and as far as possible dealt with immediately. Tab reports upon the condition of patients as they arrived at the boats for transportation and even the reports upon the condition of patients as they landed in the United States were studied for suggestions as to the best methods of treatment, splinting, etc., to be employed in dealing with these patients during the period which they spent in Savenay preliminary to departure.

In the meantime, also, statistics had been compiled with a view of determining particularly the incidence of the different casualties and the condition in which they presented themselves at Savenay. It was found that considerable numbers of patients, in some instances as high as 40 or 50 per cent, required extensive alterations of position, with new splinting, or even operation, by way of preparation for transfer to the United States. This was due, of course, to the extraordinarily difficult conditions under which many of the base hospitals were compelled to operate, but it also served to emphasize the importance of just such an organization as had been built up at Savenay for dealing with these patients at the stage and in the condition in which they arrived.

The service of reconstruction aides had been planned in the United States during 1917, but none reported for duty in France until the end of the summer of 1918. As an active part in the Savenay hospital center, however, they fortunately arrived fairly early. Three principal forms of activity were employed by this service, massage and occupational therapy in the wards, a massage clinic in dispensary fashion, and an occupational (curative) workshop. The combination of these three has regularly exercised an influence upon from 500 to 1,000 men per week in the Savenay hospital center. The amount contributed by these activities to the more rapid recovery of stiffened, contracted, and slowly recovering extremities can hardly be measured. The results are more rapid in the case of hands and fingers, which often under the influence of such treatment make more progress in a few days than had been made in weeks preceding.

NEUROPSYCHIATRIC SERVICE

Until November 6, 1918, the neuropsychiatric service at Savenay was under the direction of the commanding officer of Base Hospital No. 8. It functioned separately, with a chief of service, medical staff, and special personnel. For the first six months relatively few cases were admitted, from January 1 to June 1, 1918, the admission being 369. Two wooden barracks of 90 beds each were used during this period, but inmates had their meals with other patients. One ward was partitioned off, one end being used for disturbed patients.

After June 1, 1918, the admission rate rapidly increased and additional wards became necessary. Three more wooden barracks were used as required

for this service, providing accommodations for about 500 patients. In the meantime, wards of special construction, designed by the chief surgeon, had been erected for this service in a locality some distance from the main hospital. These 11 wards, situated on a slight elevation of ground, consisted of the administration building, a ward for officer patients, a mess hall, a barracks for enlisted personnel, and a ward for disturbed patients, the remaining wards being of uniform type, with a large day room, shower baths, and running water. This unit was occupied the latter part of August, 1918. There were accommodations for something less than 200 patients, but by using officers' barracks and enlisted men's barracks, the capacity was expanded to over 250. During this period, however, the barracks connected with Base Hospital No. 8 were still retained.

In October, 1918, 4 additional buildings of concrete block were added to the 11 wards above mentioned. When these were completed, the original barracks of Base Hospital No. 8 were relinquished. No diminution in the admission rate after the cessation of hostilities occurred, and therefore the unit as finally constructed proved inadequate. Indeed, in the late fall of 1918, admissions were so rapid that the commanding officer of the center found it necessary temporarily to designate wards from two adjacent units—i. e., Base Hospital No. 69 and Base Hospital No. 113—for the use of the neuropsychiatric service.

On November 6, 1918, the neuropsychiatric service was organized as an independent unit, taking over the quarters already occupied. The former chief of service was designated as commanding officer.

During the latter part of December, evacuation had been so rapid and admissions delayed to such an extent that for a short time there were but 65 patients in the hospital. Admissions, however, soon increased so that early in January, 1919, the population exceeded 700 patients, including 40 officers. This was quite in excess of the capacity, especially since, except as a temporary expedient, the use of the wards of adjacent units was not feasible. Under these circumstances the commanding officer of the center gave directions that one of the new 1,000 bed units be taken over as a neuropsychiatric hospital.

During the period that this organization was changed from the neuropsychiatric service of Base Hospital No. 8 to an independent unit and during the transfer subsequently of the hospital to its present site, considerable administrative work was necessary. The responsibility of this reorganizing, and of the subsequent transfer of the patients and property, as well as opening and equipping the new unit, rested particularly with the chief of the service, the quartermaster, and the officer in charge of administrative details.

The new unit was occupied January 21, 1919. The construction was not completed and special construction was necessary, this being done chiefly by patients. A sitting room was made in one end of the officers' ward, and furnished by the American Red Cross. A similar sitting room for nurses was arranged in another ward. A staff conference room was constructed in the officers' barracks. A diet kitchen, furnished by the American Red Cross, was installed in the building used for occupational therapy. Four wards were constituted closed wards, with screened windows, and in these wards parti-

tions were constructed in such a way as to make patients' day rooms. One ward building was utilized for a Red Cross recreation hut and appropriately furnished.

The large building adjacent to the mess, used in other units for surgery and dressings, was fitted up for a workshop. This workshop was especially well equipped. It had the advantage of the use of material formerly used at Base Hospital No. 117, consisting of brass-work tools, lathes, carpentering sets, and an acetylene welding apparatus. Looms for weaving were made by the patients, and woven bags, belts, and mats were manufactured. A forge was made by one of the patients. A supply of salvage material for use in the shop was secured from the salvage department at Tours. Six aides, under a director, were engaged in giving instruction. The average number of patients engaged daily was 42. A large amount of material of various kinds was manufactured in this shop. Much of this material, such as benches, tables, chairs, cabinets, and office furnishings, was used to equip the administration buildings and wards of the unit. In the metal department rings, trays, and other souvenirs were made in great number. Much of the material made was taken home by the patients.

Personnel.—Prior to June 1, 1918, the neuropsychiatric service at Base Hospital No. 8 was under the direction of a chief of service, who had from two to three assistants. He succeeded in securing the services of nurses and enlisted men with special training in this work. On June 8, 1918, Base Hospital No. 117 arrived at Savenay from the United States, en route for la Fauche. A part of the personnel, namely, 3 medical officers, 28 nurses, and 33 enlisted men remained at Savenay to take charge of the service.

After June 1, 1918, the admission rate increased rapidly. In June, 256 cases were admitted; in July, 405; in August, 588; in September, 887; in October, 658; in November, 809; in December, 412; in January 1919, 885; and in February, 824.

The organization received the cases, classified them, afforded appropriate care and treatment and furnished medical officers and personnel to transport them to the United States. Moreover, the trained personnel was sent to convoy patients to Savenay from other centers and organizations.

For purposes of classification all patients were admitted to one large admitting room of 90 beds. A special nursing force was maintained here, and observations for classifications were made at once. All patients, upon admission, were seen by the receiving officer and assigned to proper wards. The acute psychoses, cases of chronic alcoholism, and the delinquents were sent at once to closed wards. Mild psychoses, epileptics, and mental defectives were kept in open wards under supervision. Cases of psychoneuroses were sent to separate wards and, as soon as space was available, to the specially constructed wards mentioned above.

By examining and classifying at once every case administrative difficulties were reduced to a minimum. During this period but two serious accidents occurred, although delinquents of every description came through the service. At the same time patients were given as much liberty as possible—indeed, liberties which in civil life would have been considered impossible.

There was no separate mess for many months, patients going to the general mess. The center American Red Cross recreation hut was used by all, and the convalescent patients from the neuropsychiatric service often contributed very considerably to the entertainments.

As previously stated, supervision of transportation of these cases to America was rendered by this organization to the extent of furnishing medical officers and enlisted personnel. The convoys consisted as a rule of from 50 to 200 cases and occasionally more. They went by train to Brest or St. Nazaire for embarkation, patients being loaded in cars especially designated, with acute cases loaded in one special car. The number of attendants sent varied according to the type of patients. The train left the hospital under charge of a designated medical officer, who exercised supervision until patients were delivered to their destination in the United States. Since such conveyes drew heavily upon the personnel, this work could not have been carried on had not the personnel been supplemented from the hospital center.

BLIND PATIENTS

All of the blind patients whose blindness resulted from battle casualties in the American Expeditionary Forces passed through Savenay and were handled in its hospitals, where they received a certain amount of training. The general nursing care was given by the ward nurses, while the social and educational part of the treatment was given by trained teachers. Certain of the American Red Cross workers who were here for the special purpose of looking after blind patients also gave special instruction.

A school was established in the rear of ward A-15 of Base Hospital No. 8. In the morning the program included work in the schoolroom and the teaching of Braille and typewriting. In the afternoon on fine days the patients were taken for walks, or else games and readings and other forms of entertainment were conducted in the schoolroom or ward. This program was also continued during the evening, varied usually by the reading of the evening paper. On Sundays the men were conducted to church in the morning.

A pleasant variation of the work as conducted by the women of the American Red Cross was the arrangement of parties for the blind patients, the invitations to which were written in Braille, and a considerable part of the enjoyment of the party consisted of the reading of the invitation and the pleasant anticipation.

Patients who were unable to go to the schoolroom were taught at the bedside, and there were also bedside readings and games.

LABORATORY SERVICE

Each unit in the center had a laboratory which was subsidiary to the center laboratory. Supplies for these laboratories were issued by the center laboratory officer on memorandum receipt. The center laboratory performed the more technical and nonroutine work, such as serology, histology, autopsy, bacteriological type determinations, and surveys in epidemiology.

The center laboratory was divided into the following departments:

	Officers	Noncom- mis- sioned officers or tech- nicians	Private or privates, first class
(a) Administration and supply:			
(1) Administration.....	^a 1	^b 1	^c 1
(2) Supply.....		1	
(3) Media preparation and sterilization.....		1	1
(4) Glassware preparation and fatigue.....			3
(b) Pathology.....	1	2	^c 1, ^d 1
(c) Bacteriology (general).....	1	1	^c 1
(d) Wound bacteriology.....	1	1	
(e) Epidemiology.....	1	1	
(f) Serology.....	1	1	
(g) Chemistry (and water analysis).....		1	
Total.....	6	10	8

^a Major.

^b Sergeant, first class.

^c Clerk.

^d Undertaker.

CONVALESCENT CAMP

A convalescent camp was in operation at Savenay as early as April, 1918, in connection with base hospital No. 8, where 50 beds were set aside for convalescent patients.

On August 21, 1918, orders were received from the chief surgeon's office to establish a convalescent camp as a unit separate from the hospital. In compliance with this, a site was selected where the parade ground measured something like 1,800 by 1,600 feet. Fifty pyramidal tents were put up and 300 French beds placed in the tents for use of the men. This change from hospital to convalescent camp was made in one day, the patients being transferred from hospital to camp, and returns made from the camp as a separate organization. The duty personnel consisted of 1 officer and 1 enlisted man. From the first, patients were selected to act as noncommissioned officers, selection being made with care in order to get men who were responsible and who took an interest in the work.

Under Circular 11-A, 1918, chief surgeon's office, A. E. F., all patients in convalescent camps were placed on a duty status, and consequently returns were those of line organizations. This was changed after a few weeks and patients were again put on a hospital basis, necessitating again a change in forms.

In fair weather the following schedule was adhered to: The entire battalion participated in the morning exercises. These were ordinary setting up exercises and lasted for 15 minutes. Then the medical officer of each company made an inspection of his company; patients who were found not fit for further exercise were required to fall out and return to their quarters. The exercises were then continued for 30 minutes and another inspection was made, with the same procedure. After this, games were played for 5 to 10 minutes and then the companies were dismissed. At 10 o'clock the entire battalion was drilled in squads, platoons, or companies, depending upon the advancement of the soldiers. This drill lasted until 10:45.

At 2 o'clock all men were required to be on the athletic field for games, football, basket ball, indoor baseball, and volley ball, which were played until 3.45. Regimental parade was held every afternoon at 4.30. The schedule was

so arranged that each enlisted man was required to take a routine march once or twice a week; four companies going on consecutive days until Friday when the entire battalion formed and marched for an hour and a quarter to band music. Each Saturday afternoon competitive games, consisting of tugs of war between companies, baseball, obstacle races, potato races, relay races, boxing contests, and battle royals were held on the athletic field. For each event prizes were given varying from 3 pounds of candy to 1 or 2 cartons of cigarettes, the company winning most events being given a pennant. These games were always enthusiastically attended and competitors showed great interest in them.

Schools were established in connection with the camp, preliminary for the education of illiterates, but after the armistice began classes soon increased. All classes were voluntarily attended, but once a man volunteered for a course, he was required to be present at all classes of his course unless evacuated. Those who volunteered for courses were excused from other duties which interfered with their work. Teachers were detailed and the subjects taught ranged from those suitable to an illiterate foreigner to those for a high-school graduate. Instruction was given in arithmetic, reading, spelling, writing, grammar, United States history, civil government, geography, physical geography, European history, and French. The following schools also were established: Tinsmithing, motor mechanics, commercial branches, woodworking, sign painting, and dramatics.

The hours for each subject extended from 8.30 to 11 a. m., and from 1 p. m. to 4.30 p. m. A man worked the whole day on a course until he completed it. Many made astonishing progress; some men, unable at first to write their names, were able within 12 days to write short letters home. The classes were kept small, the largest number taking a course numbering 90. A total of 200 men were enrolled in the tinsmithing course and averaged six hours daily.

THE CENTER FARM

The center farm consisted of 98 acres of land leased by the American Red Cross, through which agency also were obtained implements necessary to start work. The farm proved not only of value as an adjunct to the mess facilities of the center, but also monetarily; during the summer of 1918 the sale of produce each week exceeded the farm rental for a full month. In addition, the farm proved of great benefit in the reconstruction work.

WELFARE

The American Red Cross assisted in giving surgical dressings, clothing, personal equipment of nurses and secretaries, games, novels, and a portable laundry, and huts including a nurses' and officers' hut and an auditorium for 1,650 people. It leased and equipped an experimental farm, maintained a staff of searchers, published a local newspaper, promoted recreation, distributed personal gifts such as socks, scarfs, helmets, etc., and conducted a library.

The Young Men's Christian Association conducted religious services and entertainments, including moving pictures, and gave canteen service.

COMMANDING OFFICER

Col. Webb E. Cooper, M. C.

JUSTICE HOSPITAL CENTER, TOUL

This group of hospitals was organized primarily for the purpose of taking care of the casualties in the St. Mihiel operation (April 12-16, 1918). A number of base and evacuation hospitals were ordered to Toul, where they took over permanent military barracks, just west of the city. The group consisted of the following barracks: Caserne Lamarche, Lamarche Annex, Caserne Perrin, Brichambault, Caserne Tavier, Caserne A. R., and Caserne Luxembourg. With the exception of the last, these barracks were situated very close together, on Rue de Justice, about a mile from the center of Toul. The buildings were of stone and concrete construction and the rooms were fairly well suited for purposes of hospitalization. There were no bathrooms, no means of disposing of waste in the buildings, and running water was to be found in but one or two rooms in each building.

There were two sources of water, one being individual wells and the other the Moselle River. The water was apportioned to the various hospitals at daily periods and regulated through a system of valves. It was impossible, however, to furnish any storage, as any irregularity in apportionment interfered with the supply of the other areas. The sewerage system consisted of a series of pipe lines and drains, which received the liquids from kitchens and baths.

The latrines were of the can type and none were in the buildings themselves. All the excreta of the bed patients had to be carried to these latrines, and these were often located at some distance from the wards. In the same manner all the waste liquids, bath water, etc., had to be carried from the buildings and emptied into the sewers.

The center was organized on August 27, 1918. At this time the following units had arrived: Base Hospitals Nos. 45 and 51, American Red Cross Military Hospital No. 114, and Evacuation Hospitals Nos. 3 and 14. Later, Base Hospitals Nos. 82, 55, 78, 87, and 210 arrived and Evacuation Hospitals Nos. 3 and 14 were relieved from the center. In addition to these, gas, contagious, and neurological hospitals were organized. When completely organized the center had a capacity of 15,250 beds.

The center staff was organized into the following divisions: Adjutant, consultants in medicine and surgery, quartermaster, evacuation officer, laboratory officer, sanitary officer, transport officer, medical supply officer, and chaplain.

The supply depot was established on September 8, 1918, in one of the permanent barracks of the center. Prior to this time all supplies had to be obtained from the First Army depot.

The office of the Quartermaster Department began functioning on September 8, 1918, when the first carload of supplies was received. During the

* The statements of fact appearing herein are based on the "History of the Justice hospital center," prepared under the direction of the commanding officer by members of his staff. The material used by these officers in the compilation of the history comprised official reports from the various divisions of the hospital center. The history is on file in the Historical Division, S. G. O.—Ed.

month of September, the work of this department was very much handicapped on account of the difficulty in obtaining supplies. This was due to the congestion at the railhead during the activities in the St. Mihiel sector. A large riding hall in one of the barracks was used as a warehouse and afforded ample space. On November 20, 1918, Bakery Company No. 11 was established, and for the first time the bread supplied to the center was made at that port.

The greater part of the laundry work was done at the large laundries in Toul and Nancy. Each unit had one or more French hand laundries, but the amount of work these could do was too small to be of material help. A group disinfecting plant, consisting of three steam disinfectors, was operated for all the hospitals.

Evacuation Ambulance Co. No. 7, which arrived on August 28, 1918, handled all transportation until September 21, 1918, when a center motor transport service was established.

The office of the group chaplain was organized on September 21, 1918. In addition to the regular duties of a chaplain, this officer also had charge of all the entertainments furnished through the cooperation of the Y. M. C. A. A post school was established by the chaplain on March 10, 1919, with a class of about 28, but due to the many changes occurring in the personnel it soon became extinct.

Surgical cases usually were treated in Base Hospitals Nos. 45, 51, 82, 55, and 78; however, in October and November these hospitals received medical cases also. During the St. Mihiel operation and immediately after, this center received a large percentage of the total casualties for the First Army. During the period September 12-25, 8,340 surgical cases were admitted, and the base hospitals temporarily functioned as field and evacuation hospitals. After September 26, the group did not receive any considerable number of battle casualties direct. The surgical services suffered, especially during the early active period, from lack of surgical instruments and trained personnel. In January, 1919, all surgical cases were transferred to and cared for in Base Hospital No. 45.

The medical service did not receive many patients until the latter part of September, 1918. After this time, however, the influenza epidemic assumed large proportions and the service soon became overcrowded. A contagious hospital was opened, with a bed capacity of 600. All cases were held here until over their infectious period.

A neurological hospital was opened on September 7, 1918, with a bed capacity of 1,000. It was well outfitted, in large part by the American Red Cross. The hospital was designated Neurological Hospital No. 2. It acted very much in the manner of an evacuation hospital, with an equipment and staff of an elaborate base for nervous cases. Of 259 cases treated there during the first month, 63 per cent were returned to duty. Other evacuations were made by ambulance to Base Hospital No. 116, at Bazoilles, and to Base Hospital No. 117, at La Fauche.

A large center laboratory was established in Caserne Lamarche on September 23, 1918. It occupied excellent quarters and consisted of six rooms. This laboratory made all the special bacteriological examinations, Wasser-

mann tests, colloidal gold tests, and dark field examinations, made cultures, and prepared media, solutions, and sera. The individual hospitals made post-mortem examinations, routine clinical, pathological, and bacteriological examinations.

The majority of patients were transported to the center from the front by ambulances. Prior to November, 1918, there was no central triage, and the hospitals were designated to receive cases arbitrarily as regards location, personnel, and equipment. This caused considerable difficulty and confusion. About the middle of November a center triage was organized, consisting of 10 Bessonneau tents. All incoming ambulances were directed to this central point by road signs and guides. Two officers, two noncommissioned officers, and twenty privates, selected from the various hospitals, were on duty at all times. It was the duty of the triage officer to have the ambulances unloaded, examine all patients and field cards (and if necessary make a provisional change in diagnosis), and direct patients to designated hospitals. This system necessitated a change in the staffs of the various hospitals so that they more readily might treat the types of cases sent to them. Evacuation of all patients was made from the hospitals, as there was no convalescent camp in this center. Evacuation of class A patients was made either through replacement battalions or regulating stations, though some class A patients were evacuated directly to their organizations. Reclassified patients were sent to the 1st Depot Division at St. Aignan, with the exception of class D patients, who were sent directly to the hospital center at Savenay. All mental and neurological cases were sent in ambulance convoys to Base Hospitals Nos. 116 and 117. All patients evacuated to the rear were transported in American and French hospital trains. A consolidated list of patients to be evacuated was telephoned to the regulating officer at St. Dizier twice a day, who, in turn, dispatched trains as necessity called for them. The evacuating officer usually received from 2 to 12 hours' notice as to when a train would arrive at the center and made requests for litter bearers on the hospitals which were to evacuate lying cases.

The American Red Cross furnished the center large quantities of instruments, drugs, and hospital equipment. It also distributed literature and many special articles not furnished by the Army to the patients. To each hospital was assigned a searcher whose duty it was to trace soldiers reported missing, and perform special services for patients, such as writing letters, sending telegrams, etc.

Recreation rooms for nurses and enlisted men were established in each hospital, where theatricals, concerts, and moving-picture shows were produced.

COMMANDING OFFICER

Col. Henry C. Maddox, M. C., August 27, 1918, to November 13, 1918.

Col. Robert M. Thornburgh, M. C., November 14, 1918, to discontinuance of center.

HOSPITAL CENTER, VANNES *

This center came into existence officially on November 3, 1918, when 1 officer and 50 men of the Medical Department arrived and took over certain buildings requisitioned from the French. Geographically the center embraced Vannes, Auray, Plouharnel, Carnac, and Quiberon, covering an area of 30 miles.

Headquarters of the center were organized November 11, 1918, at Vannes. Here large barrack buildings, known as the Quartier Senarmont, were taken over. This caserne, following the general plan of the French Army barracks, was surrounded by a wall inclosing a compound measuring 760 by 860 feet. Within this area were three large four-story barracks, kitchens, guardhouse, stables, veterinary hospital, and other buildings. It was planned that 2,300 patients could be cared for in this inclosure. The buildings were in very poor repair, and the only advantages provided were ample space, a site free from mud, and an abundant supply of good water. Considerable construction was effected in this caserne, such as extending water pipes to the upper floors, placing of sinks, etc.

In Carnac the United States Government leased a hotel and five villas. The hotel, which accommodated about 200 patients, was at the beach of Baie de Quiberon, about 2 miles from Carnac. It was used for convalescent respiratory cases, who rapidly improved in health at this point.

In Quiberon the hospitalization consisted of 12 small hotels and villas, only 2 holding more than 100 beds. The hotels were not modern and lacked adequate facilities for light, heat, and bathing. The distance of this group from headquarters of the center made difficult its supply and control; therefore, the properties were given up on January 18, 1919.

Near Plouharnel, a large three-story monastery, the Abbey St. Michiel, with a bed capacity of 500, was taken over, but was used only once for patients, and then for a short time only.

Hospitalization at Auray consisted of 2 hotels with a capacity of 350 beds. These were unsatisfactory and were never used for patients, leases on them being given up in December, 1918.

Base Hospitals Nos. 136 and 236 operated in this center and up to March 1, 1919, admitted a total of 3,224 patients.

In February, 1919, Base Hospitals Nos. 4, 5, 10, 12, and 21 were ordered to this center for quarters, awaiting transportation to the United States. This hospital center was discontinued in June, 1919.

COMMANDING OFFICER

Col. Robert M. Blanchard, M. C.

* The statements of fact appearing herein are based on the "History of the Vannes hospital center," prepared under the direction of the commanding officer by members of his staff. The material used by these officers in the compilation of the history comprised official reports from the various divisions of the hospital center. The history is on file in the Historical Division, S. G. O.—*Ed.*

HOSPITAL CENTER, VICHY¹

The hospital center at Vichy, though planned early in 1918, was not organized officially until August 12, 1918. Two base hospital units, Nos. 1 and 19, were then operating. The French Medical Department had been using many of the larger hotels in Vichy as hospitals since the beginning of the war in 1914. Twenty-eight of these were turned over to the United States Army, and later additional hotels were leased from private owners, so that eventually 86 hotels, large and small, were utilized by the center, the total bed capacity of the center at its maximum being 19,000. In addition, 13 garages, and laundries were taken over for use.

The following units operated in the Vichy center before the armistice: Base Hospitals Nos. 1, 19, 115, 76, Hospital Train Unit No. 41, and Hospital Unit D. After the armistice began the following units arrived: Base Hospital No. 109, Evacuation Hospitals Nos. 25, 33, and Convalescent Camp Co. No. 9. The latter organization never functioned as a convalescent camp.

Vichy had many advantages as a hospital center. The location, although apparently somewhat distant from the battle lines, was well chosen owing to favorable railroad connections. Patients were received in some instances within 24 to 36 hours after receipt of injuries, and frequently they arrived with their original dressings, although a very large proportion of the patients had passed through evacuation or base hospitals.

Vichy, being a famous watering resort, established for many years, was a well-developed small city. The streets were well paved and well lighted, thus greatly facilitating the handling of patients arriving on trains at night. There also was an excellent water supply; gas and electric current were obtainable in abundance.

The Grande Établissement Thermal et Physiothérapeutique, which we used, was well equipped with electrical, X-ray, and orthopedic appliances that were of value in the treatment of orthopedic and nerve injuries during our occupancy. The hotels on the whole were well adapted for hospital use, the larger, first-class ones being well equipped with bathing facilities and modern kitchens. On the other hand, the smaller hotels were not so well suited, but were used to great advantage for the walking cases and the less seriously wounded.

The Quartermaster Department was divided into finance, subsistence, property, clothing, and miscellaneous sections. Another officer was assigned to the building department, which was charged with maintenance and repair of approximately 90 buildings. A force for this last purpose was organized from among the different base hospital units. Requests for repairs averaged 70 a day. As the center grew a railway transport officer, a motor transport officer, and an engineer officer were assigned to the center. A quartermaster officer was assigned to the bakery and another to the laundry.

Motor transport of various types and makes was provided. Part of the personnel to operate this was furnished by the motor transport officer and part was composed of convalescents and other personnel at the center.

¹ The statements of fact appearing herein are based on the "History of the Vichy hospital center," prepared under the direction of the commanding officer by members of his staff. The material used by these officers in the compilation of the history comprised official reports from the various divisions of the hospital center. The history is on file in the Historical Division, S. G. O.—Ed.



FIG. 118.—Hôtel des Bains, part of Vichy hospital center

The problems connected with the mess arrangement for the center were most difficult. By the end of October 15,000 persons were being subsisted. During the period of greatest stress there were 36 messes in operation. Though each hospital unit had its own mess officer, a group mess officer, assisted by 10 clerks, managed the messes from the beginning of the center until its closure. In this way a central purchasing department was maintained and the messes throughout the center were coordinated. The central mess office procured and issued not only food supplies but also mess equipment. The walking patients, who occupied many of the 86 buildings, were marched under a noncommissioned officer to a close-by mess.



FIG. 119.—Hotel Lilas, part of Vichy hospital center

For a time, bread was made by local French bakers, who were furnished American flour; however, on July 10, 1918, three units of Bakery Company No. 12 arrived with complete equipment and thereafter baked all bread required by the center. During the period November 1 to 10, 1918, this organization produced 11,050 pounds of bread daily.

Laundry was done, prior to the organization of the center, by a civilian laundry. This arrangement soon proved inadequate, and on August 20, 1918, the Quartermaster Department leased a laundry in Bellerive, near Vichy, and Laundry Company No. 302, consisting of seven men, was placed in charge. This company supervised a day and night shift of French civilian help. When this laundry proved inadequate another, the Les Bains, was leased and placed in charge of Laundry Company No. 509. In order to avoid any danger of infection, all underclothes, uniforms, and linen which had been in contact with incom-

ing patients were sent to the Les Bains laundry, all other hospital linen being sent to the Bellerive laundry. A salvage department was inaugurated in conjunction with the laundry.

A bathing establishment was secured on October 14, 1918, by contract from the French, to provide proper bathing facilities for the patients upon admission. All walking cases were taken there immediately from the train and bathed. New clothing was issued to them before they were sent to a hospital; their old clothing was sent to a delousing station. In this way it was possible to keep practically every one of the 86 buildings in operation free from infection. This establishment was used also for the walking cases and the personnel of the center. The heating system was excellent, allowing over 200 baths a day to be given. The number of baths given at this establishment from October 14, 1918, to January 15, 1919, was 61,854.



FIG. 120.—A ward, Base Hospital No. 1, Vichy hospital center

Each of the base hospital units in the center occupied on the average of over 20 buildings, each building being in charge of a medical officer who was responsible to the commanding officer of his unit for the professional service, both medical and surgical, and the discipline and police of the building of which he was in charge. The commanding officer of the unit was in turn responsible to the commanding officer of the center.

Maxillofacial and neurosurgical cases were sent to this center, especially after September 6. Base Hospital No. 115, which then arrived, was soon charged with the care of such cases as well as general surgical cases.

Evacuation of patients was made as soon as the patients were reported ready. They were classified and reported as in various classes fit for evacua-

tion. Each week the commanding officer of each hospital was sent a statement of the percentage of patients evacuated in each of these classes, by the center and by each base hospital, in order that the commanding officer might know whether his ward surgeons were taking advantage of all evacuations possible.

The American Red Cross at Vichy provided a warehouse for materials and distribution, a canteen, including a hall for dancing, a theater, reading and writing rooms, and a diet kitchen and a serving room for French. An officers' club, a noncommissioned officers' club, a nurses' club, and a gymnasium were



FIG. 121.—Officers' mess at the Hotel Sevigne, Vichy hospital center

provided. It leased a building for a nurses' club over which a representative of the Y. W. C. A. presided. The Red Cross furnished hundreds of cases of supplies, provided many entertainments, and conducted, through searchers, a home-communication service.

Beginning on February 1, 1919, some of the hotels were returned to their owners and the center was discontinued in April, 1919.

COMMANDING OFFICER

Col. Walter D. Webb, M. C.

HOSPITAL CENTER, VITTEL-CONTREXEVILLE "

The hospital center at Vittel-Contrexeville was located in the small towns of Vittel and Contrexeville. Vittel is about 60 kms. east of Chaumont and about 90 kms. west of the Alsace border. Contrexeville is 4 kms. southwest of Vittel.

Both towns had been well-known watering places, situated in the foothills of the Vosges Mountains. Being at a considerable altitude, they had a cold, rigorous climate, with winter coming early and remaining long, accompanied by much snowfall. All industries of both places were connected with the service of their hotels and springs. The waters in no way influenced the selection of this location for hospitals, and they were not used in the hospitals of the center, except by those who desired to do so.



FIG. 122.—Casino used as the officers' club, Vichy hospital center

Vittel has an excellent water supply derived from the springs in the hills above the town, which, though at times taxed to the utmost, was beyond suspicion as to purity. A total of 100,000 gallons per day was allowed for the hospitals, which, with proper care, was sufficient. Contrexeville was not so fortunately situated with respect to its water supply. No large springs were available and each hotel had its own more or less shallow well. Being intended only for summer use, all piping was exposed, causing endless trouble from freezing during cold weather. Practically all water in Contrexeville was determined to be nonpotable.

" The statements of fact appearing herein are based on the "History of the Vittel-Contrexeville hospital center," prepared under the direction of the commanding officer by members of his staff. The material used by these officers in the compilation of the history comprised official reports from the various divisions of the hospital center. The history is on file in the Historical Division, S. G. O.—Ed.



FIG. 123.—Building used as the noncommissioned officers' club, Vichy hospital center

Both towns had fairly satisfactory electric lighting plants, of sufficient capacity both for lighting purposes and for the operation of X-ray equipment.

There was also a well-defined park system, especially so in Vittel. This, together with the privilege of the tennis courts and golf links, made a very valuable adjunct to the center.

Prior to the arrival of the Americans and for a short time after the establishment of our hospitals at Vittel and Contrexeville, in the winter of 1917-18, the French occupied some of the hotel buildings for hospital purposes. These buildings were turned over to us by the French. All other buildings were leased from their owners; in case of refusal on the part of the owner, they were



FIG. 124.—Two small hotels used for the enlisted men, Vichy hospital center

requisitioned. In this way, by November 17, 1917, buildings for 5,500 beds had been acquired; and eventually 74 hotels, villas, and other buildings were occupied by the hospital units. The bed capacity at its height was 11,075, including crisis expansion and beds in the convalescent camp, which, however, were never occupied. In compensation for beds allotted us at other points, 2,700 beds were reserved for French patients. Villas were leased for officers and nurses, the casino for enlisted men; garages were provided for the military police, storeroom, and medical supply. All buildings were of concrete and stone construction and more or less fireproof in some cases; in others, especially in Contrexeville, veritable firetraps. The hotels were from three to five stories high, with from 40 to 300 rooms, some of which were reserved for storage. No buildings had heating plants that were adequate. Heating was very unsatis-

factory, and it was early realized that proper heating was not to be obtained. Seven thousand French stoves were received shortly after the arrival of the units and were installed. The labor involved in caring for this number of stoves, the carrying of the coal and ashes, four to five flights, was enormous. Practically every hotel building had its own kitchen range installed and in fair working condition.

All buildings were piped for water, and had a sewerage system that was wholly inadequate for the number of patients in each during crisis expansion. Cesspools were situated under the kitchen floor, and whenever the capacity of the cesspool was exceeded the inevitable result was a flooding of the floor of the kitchen. By continually pumping over the cesspool this was reduced to a minimum.

Four base hospital units were assigned to Vittel and Contrexeville. These were Base Hospitals Nos. 23, 36, 32, and 31 to Contrexeville, the first one arriving December 17, 1917, and the last one January 1, 1918. On March 13, 1918, three hospital units, B, R, and G, arrived and reinforced the hospitals. Prior to the organization of the center, each unit had its own quartermaster and medical supply officer, submitted its own requisitions, and controlled its own transportation.

On January 27, 1918, one officer of the group was placed in command of all four hospital units, thus inaugurating the hospital-center system of coordinating the activities of several hospital units grouped together. The organization of the center at the height of its activity was as follows: Commanding officer, adjutant, quartermaster, evacuating officer, sanitary officer, medical supply officer, assistant provost marshal, air raid officer, motor transport officer, railway transport officer, laboratory officer, professional consultants in surgery, medicine, neuropsychiatry, orthopedics, and ophthalmology.

To a great extent the headquarters staff was organized by detailing officers from several units. Each headquarters staff in organizing his department chose personnel from the organizations which he knew were capable. It was realized that these units were well supplied with especially qualified men, therefore no request was made for an additional force to form a headquarters detachment. The headquarters detachment was formed by details from the constituent organizations, especially the base hospitals.

Certain special and technical units were organized as follows: Sanitary squads, one in each town. A provisional ambulance company was organized from personnel and ambulances belonging to the base hospitals. It was under the control of the evacuation officer, who was responsible for the movement of all patients. This arrangement was found more satisfactory than to have the ambulances under the motor transport officer.

A laboratory was established in each town, under the control of the center laboratory office. Each hospital, however, retained enough laboratory equipment to perform routine clinical examinations.

As all organizations were well equipped with nonexpendable property, a medical supply depot was not established. A center storehouse was maintained, and all requisitions were made out by the center supply officer.

A laundry plant was leased in a town about 4 km. from Vittel, which, after being remodeled by the Army engineers, was satisfactory. A laundry company of 1 officer and 16 men operated the plant.

At first bread was obtained from Is-sur-Tille. Later a section of a field bakery was obtained, with two ovens. This, with another oven belonging to one of the units, was sufficient to supply fresh bread to all organizations. During quiet times the extra oven was used for pastry and other extras.

The quartermaster storehouse occupied two large garages at Vittel, centrally located, and a small branch was established at Contrexeville. A well-stocked sales commissary was kept, and organizations in surrounding towns were supplied. There never was a shortage of subsistence articles.

An air raid officer was appointed who drew up such regulations as were necessary for the protection of patients, personnel, and property. Windows were kept screened at night, which was an extremely difficult matter, with the thousands of windows in a single building, some of them so large and so situated as to be almost impossible to cover. For some time the French kept a railroad artillery train parked in the city, and considerable time was required to get it removed. It was not considered in keeping with the provisions of the Geneva convention to construct a cross for protection while these combat organizations were within the city, but after they were ordered away the cross was constructed. Although surrounding towns were repeatedly bombed this center fortunately escaped.

During the winter of 1917-18 and spring of 1918 patients were admitted principally from the surrounding training areas, and from Baccarat and Lunéville, where our troops were in the trenches. Numerous gas cases were admitted to the center at this time.

The admission of French patients required a duplication of records and necessitated a providing of the French ration, but was an excellent experience for all the units at a time when there were not sufficient American patients to keep the personnel busy. During this period of adjustment not many patients were arriving and the keenest rivalry developed in obtaining patients. Later a receiving office was established and all arriving ambulances were required to report there. All distributions were made by direction of the commanding officer of the center.

During the month of September steps were taken to establish a convalescent camp of 1,200 capacity. This camp was ready for occupancy when the armistice was signed, whereupon the project was abandoned.

A Red Cross hut was constructed at both Vittel and Contrexeville for the enlisted men, and a well-stocked canteen was maintained at both places. A hut for the nurses also was constructed and furnished in Vittel and a theater leased in the Casino, where moving pictures and other entertainments were provided. This organization also leased a bathing establishment, where hot and cold baths were available for personnel and patients at all times.

The Vittel-Contrexeville center was discontinued in January, 1919.

COMMANDING OFFICER

Col. Guy V. Rukke, M. C.

CHAPTER XXIV

BASE HOSPITALS^a

BASE HOSPITAL NO. 1^b

Base Hospital No. 1 was organized in September, 1916, at the Bellevue Hospital, New York City. The unit was mobilized on November 21, 1917, at the 12th Regiment Armory, New York City, where it remained in training until February 26, 1918, on which date it left New York on the *Olympic*, arriving in Liverpool, England, March 6, 1918. It left Liverpool March 6 for Southampton, England, where officers and enlisted men remained in the rest camp for three days prior to crossing to Le Havre, France, March 10, 1918. It left Le Havre March 11 en route to Vichy, Department Allier, in the intermediate section, A. E. F., where it arrived March 12, 1918. Upon arrival at Vichy Base Hospital No. 1 took possession of nine hotels that had been used by the French as hospitals since 1914, and on March 20, 1918, reported that the hospital was ready to receive patients. The first patients, 252 French wounded, arrived on April 9, and the first American patients, 358 in number, were admitted April 11, 1918.

Base Hospital No. 1 functioned from April 9, 1918, to January 20, 1919, during which time 8,142 surgical and 7,481 medical cases were treated. During this period the unit maintained 12 separate messes and occupied over 20 hotels in which sick and wounded were cared for. The unit left Vichy March 5, 1919, en route to St. Nazaire, for return to the United States; it sailed April 14, 1919, on the *Princess Matoika*, and arrived in Newport News, Va., April 27, 1919, where, at Camp Hill, the unit was demobilized.

PERSONNEL

COMMANDING OFFICER

Col. Walter D. Webb, M. C., October 16, 1917, to August 24, 1918.

Maj. Joseph McKee, M. C., August 25, 1918, to September 24, 1918.

Lieut. Col. Arthur W. Wright, M. C., September 25, 1918, to demobilization.

CHIEF OF SURGICAL SERVICE

Maj. Richard T. Atkins, M. C.

CHIEF OF MEDICAL SERVICE

Maj. George B. Wallace, M. C.

^a Only those base hospitals which operated as such in France are included in this chapter. This will account for the absence of certain numbers in the series.—*Ed.*

^b The statements of fact appearing herein are based on the "History, Base Hospital No. 1, A. E. F.," by Lieut. Col. Arthur M. Wright, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

BASE HOSPITAL NO. 2^c

Base Hospital No. 2 was organized at the Presbyterian Hospital, New York City, during February, 1917. The unit was mobilized in May, 1917. It sailed from New York on the *St. Louis*, on May 12, 1917, and arrived in England on May 23, 1917. Upon arrival in England the unit was attached to No. 1 General Hospital, British Expeditionary Force, at Etretat, France, arriving at that station on June 2, 1917, where it remained until January, 1919. The organization sailed from Europe aboard the *Agamemnon*, March 3, 1919, arrived in the United States March 11, 1919, and was demobilized at Camp Meade, Md., February 17, 1919.

PERSONNEL**COMMANDING OFFICER**

Lieut. Col. Lucius L. Hopwood, M. C., May 9, 1917, to January, 1918.

Col. William Darrach, M. C., January, 1918, to July 19, 1918.

Maj. Willard B. Soper, M. C., July 20, 1918, to demobilization.

BASE HOSPITAL NO. 3^d

Base Hospital No. 3 was organized in September, 1916, at the Mount Sinai Hospital, New York City. It was called into active service November 14, 1917, the entire command being mustered into service by November 21, 1917. The armory of the First Field Hospital, National Guard of New York, New York City, was selected as the mobilization and training center. The nurses were mobilized January 15, 1918, at Ellis Island, N. Y. The unit remained in training at the armory until February 6, 1918, when it embarked on the *Lapland*, leaving New York the same date. The *Lapland* arrived in Halifax on February 8, and left for Europe on February 13, 1918, reaching Glasgow, Scotland, February 25, 1918. The nurses of Base Hospital No. 3 were detached from the unit at Glasgow, and sent by way of London to the casual depot at Blois, France, and rejoined the unit April 18, 1918. The officers and enlisted men proceeded to Southampton, England, arriving on February 26, 1918. On the following day they crossed the English Channel on H. M. S. *Hunslet*, arriving at Le Havre, France, February 28, 1918. The officers and enlisted men left Le Havre March 1, 1918, by train en route to Vauclaire, Department of Dordogne, base section No. 2, their permanent station, arriving there March 3, 1918.

An old monastery, comprising numerous cement buildings, was turned over to Base Hospital No. 3. In two months' time these had been converted to hospital purposes, later being expanded to a hospital of 2,800-bed capacity. The first patients arrived May 13, 1918, Hospital Train No. 53 bringing 104 patients from Base Hospital No. 9, Chateauroux. The railroad station was 2½ miles from the hospital, but as ample motor transportation had been provided, evacuation of trains was never delayed. During its activity, May 13, 1918, to January 20, 1919, Base Hospital No. 3 cared for 9,127 patients, surgical and medical. This hospital was designated by the chief surgeon, A. E. F., as

^c The statements of fact appearing herein are based on the "History, Base Hospital No. 2, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

^d The statements of fact appearing herein are based on the "History, Base Hospital No. 3, A. E. F.," by Maj. George Baehr, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed

one of the hospitals to receive cases of suspected pulmonary tuberculosis, 222 such cases being admitted during its period of activity. The largest number of patients in hospital was November 5, 1918, when 2,765 sick and wounded were being treated.

Base Hospital No. 3 ceased to function as a hospital on January 20, 1919, having been relieved on that date by Base Hospital No. 71. The unit of Base Hospital No. 3 left Vauclaire on March 7, 1919, and proceeded by rail to the Beau Desert hospital center, to await transportation to the United States. It sailed on the *Pastores*, March 14, 1919, and arrived at Newport News, Va., March 26, 1919. The entire unit was demobilized at Camp Upton, N. Y., on April 4, 1919.



FIG. 125.—Base Hospital No. 3, Vauclaire

PERSONNEL

COMMANDING OFFICER

Col. Michael A. Dailey, M. C., August 23, 1917, to October 17, 1918.
 Maj. Herbert L. Celler, M. C., October 18, 1918, to October 21, 1918.
 Lieut. Col. George Baehr, M. C., October 22, 1918, to demobilization.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Howard Lillienthal, M. C.
 Maj. John W. Means, M. C.
 Maj. Walter M. Brickner, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Herbert L. Celler, M. C.

BASE HOSPITAL NO. 4^{*}

Base Hospital No. 4 was organized at Lakeside Hospital, Cleveland, Ohio, during August, 1916, and was mobilized at Cleveland about May 5, 1917. The unit left Cleveland on May 6, 1917, arrived at New York and embarked on the *Orduna* May 7, 1917. It sailed for Europe on May 8, 1917, arriving at Liverpool May 17, thus being the first unit of the United States Army to reach Europe. After spending several days in London, it left there on May 24, en route to Rouen, France, arriving at that station for duty on May 25, 1917. It was one of the original six base hospitals sent to Europe for duty with the British and remained with the British Expeditionary Force in France during its entire overseas existence, operating as No. 9 General Hospital, British Expeditionary Force. It ceased functioning about March 1, 1919, sailed from Europe on the *Agamemnon* on March 31, arrived in the United States on April 7, 1919, and was demobilized shortly thereafter.

PERSONNEL

COMMANDING OFFICER

Col. Harry L. Gilchrist, M. C., May 3, 1917, to December 14, 1917.

Lieut. Col. William E. Lower, M. C., December 15, 1917, to April 30, 1918.

Capt. Allen Graham, M. C., May 1, 1918, to September 17, 1918.

Lieut. Col. Frank E. Bunts, M. C., September 18, 1918, to demobilization.

BASE HOSPITAL NO. 5[†]

Base Hospital No. 5 was organized in February, 1916, at the Harvard University, and was mobilized in May, 1917. The unit left New York May 11, 1917, on the *Saxonia* and arrived at Falmouth, England, May 22, 1917, and at Boulogne, France on May 30, 1917. It was assigned to the British Expeditionary Force in France and was ordered to take over British General Hospital No. 11. This hospital was situated between the towns of Dannes and Camiers, Department Pas de Calais. It functioned there until November 1, 1917, when it was transferred to Boulogne sur Mer, where it took over and operated British General Hospital No. 13.

While at Dannes-Camiers, Base Hospital No. 5 frequently was attacked by enemy aircraft, and on the night of September 4, 1917, suffered several casualties. Lieut. William T. Fitzsimons, M. C., was killed, Lieuts. Rae W. Whidden, Thaddeus D. Smith, and Clarence A. McGuire, M. C., were wounded. Lieutenants Whidden and Smith subsequently died. Three enlisted men were killed and five severely wounded; one nurse and twenty-two patients were wounded. These deaths were the first among the American Expeditionary Forces due to enemy activity.

The hospital occupied a large municipal building, the bed capacity of which was 650. During its activity, June 1, 1917, to January 20, 1919, this

^{*} The statements of fact appearing herein are based on the "History, Base Hospital No. 4, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C. — *Ed.*

[†] The statements of fact appearing herein are based on the "History, Base Hospital No. 5, A. E. F.," by Maj. Henry Lyman, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C. — *Ed.*

hospital cared for 45,837 patients, both surgical and medical. Of this number 41,015 were British and 4,822 Americans. The greatest number of patients admitted in one day was 964.

The unit was relieved from duty with the British on January 20, 1919, and sailed from Brest, France, April 7, 1919, on the *Graf Waldersee*, arriving at New York April 20, 1919. The unit was demobilized May 2, 1919, at Camp Devens, Mass.

PERSONNEL

COMMANDING OFFICER

Col. Robert U. Patterson, M. C., May 5, 1917, to February 27, 1918.
Lieut. Col. Roger I. Lee, M. C., February 28, 1918, to September 6, 1918.
Maj. Henry Lyman, M. C., September 7, 1918, to demobilization.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Roger I. Lee, M. C.
Maj. Reginald Fitz, M. C.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Horace Binney, M. C.

BASE HOSPITAL NO. 6^a

Base Hospital No. 6 was organized in March, 1916, at the Massachusetts General Hospital, Boston, and was mobilized May 24, 1917, at Boston. It left there June 1, 1917, for Fort Strong, Mass., its training station, where it remained until July 8, 1917, when it proceeded to New York, embarking the next day on the *Aurania*. The entire unit sailed from New York July 9, 1917, arriving at Liverpool, England, July 24, 1917. It left Liverpool immediately by special train for Southampton, arriving there July 24, and sailed the same night for Le Havre, France, on the Australian hospital ship *Warilda*. It remained at Le Havre two days and proceeded, July 27, by rail to Bordeaux, Department Gironde, base section No. 2, A. E. F., its permanent station.

Upon arrival at Bordeaux, July 28, the unit occupied French Hôpital Complémentaire No. 25 (Petit Lycée de Bordeaux). A company of Engineers was assigned to the hospital for construction purposes, and work started September 8, 1917. A new kitchen, dining rooms, a warehouse, additional wards and barracks for officers, enlisted men, and nurses were built. Some of the buildings were not completed until June, 1918. The normal capacity of hospital was 3,000 beds, and with "crisis expansion" 3,898 beds and cots, including Red Cross huts and corridors. Patients first arrived August 21, 1917. The total number of patients treated, both surgical and medical, was 26,156, including 580 allied sick and wounded. The largest number of patients in hospital was on September 7, 1918, 3,134 then being cared for.

On January 14, 1919, Base Hospital No. 6, was relieved by Base Hospital No. 208, and ceased to function.

^a The statements of fact appearing herein are based on the "History, Base Hospital No. 6, A. E. F.," by Lieut. Col. W. L. Babcock, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

The unit of Base Hospital No. 6 was transferred March 5, 1919, to the Beau Desert hospital center, France, for transportation to the United States. It sailed on the *Antigone* from Bordeaux, March 12, 1919, en route to New York, arriving there March 24, 1919. After a delay of 12 days at Camp Merritt, N. J., the organization was transferred to Camp Devens, Mass., arriving there April 6, 1919, and was mustered out of the service April 9, 1919.

PERSONNEL

COMMANDING OFFICER

Col. Frederick A. Washburn, M. C., May 29, 1917, to April 24, 1918.

Col. Warren L. Babcock, M. C., April 25, 1918, to January 18, 1919.

Lieut. Col. Lincoln Davis, M. C., January 19, 1919, to demobilization.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Addison G. Branizer, M. C.

CHIEF OF MEDICAL SERVICE

Col. Richard C. Cabot, M. C.

BASE HOSPITAL NO. 7 ^a

Base Hospital No. 7 was organized in December, 1916, at the Boston City Hospital, Boston. The unit was mobilized in February, 1918, at Camp Devens, Mass., where it remained in training until July 6, 1918, when it left Camp Devens. It sailed from New York July 8, 1918, on the *Leviathan*; arrived in Brest, France, July 15, 1918. After spending two weeks there it was ordered to Joue-les-Tours, Department Indre et Loire, for station. Upon arrival at Joue-les-Tours, July 30, 1918, Base Hospital No. 7 occupied one type A unit, constructed by the engineers. Base Hospital No. 7, with a convalescent camp, formed the Joue-les-Tours hospital center. The first convoy of sick and wounded was received on August 18, 1918; 3,518 surgical and medical cases were received by convoys during its activity. In addition, patients were treated from headquarters, Services of Supply, Tours.

On January 17, 1919, the hospital ceased to function, being on that date relieved by Base Hospital No. 120. The personnel of Base Hospital No. 7 left France from St. Nazaire March 14, 1919, on the *Manchuria*, and arrived at Camp Merritt, N. J., March 24, 1919. From Camp Merritt the unit was transferred to Camp Devens, Mass., and there mustered out of the service on April 14, 1919.

PERSONNEL

COMMANDING OFFICER

Col. A. M. Smith, M. C.

CHIEF OF SURGICAL SERVICE

Lieut. Col. E. H. Nichols, M. C.

CHIEF OF MEDICAL SERVICE

Maj. John J. Thomas, M. C.

^a The statements of fact appearing herein are based on the "History, Base Hospital No. 7, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O. Washington, D. C.—Ed.

BASE HOSPITAL NO. 8¹

Base Hospital No. 8 was organized in November, 1916, at the Post-Graduate Hospital, New York City. The unit was mobilized at Fort Jay, N. Y., July 18, 1917. After 10 days of drilling and equipping the organization embarked July 29, 1917, on the *Saratoga*. On July 30, shortly after midday mess, the *Saratoga*, while at anchor in New York harbor, was rammed by the *Panama*, and so badly damaged that all passengers were disembarked and transported back to Governors Island. The unit lost most of its equipment and personal property on the *Saratoga*, but after a week of reequipping embarked again on August 7, 1917, and sailed the same date on the *Finland*.

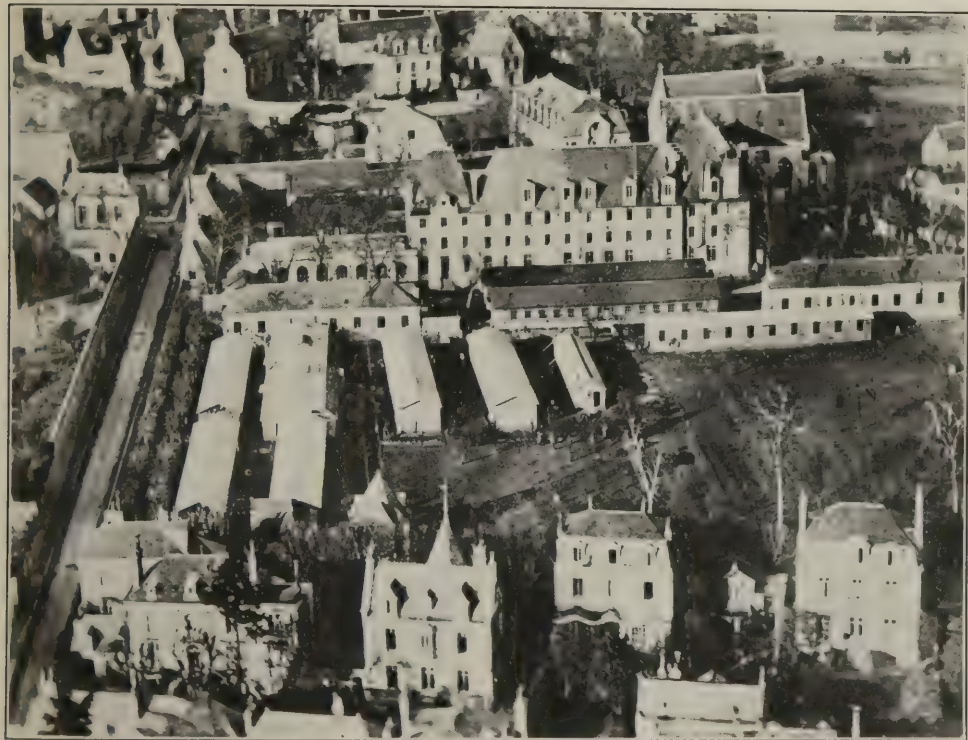


FIG. 126.—Airplane view of Base Hospital No. 7, Joue-les-Tours.

The unit arrived at St. Nazaire, France, August 20, 1917, and next day took station at Savenay, Department Loire Inferieure, base section No. 1. Base Hospital No. 8 was the first hospital to arrive at Savenay, and formed the nucleus of what was to be one of the largest and most important hospital centers in France. It occupied the normal school of Savenay, a large, white-stone building, which it transformed into a hospital. In addition to this a number of wooden buildings and storehouses were built by the engineers, so that the normal capacity of the hospital in November, 1918, was 2,460 beds. This hospital received both medical and surgical cases, but from August, 1918,

¹ The statements of fact appearing herein are based on the "History, Base Hospital No. 8, A. E. F.," by Lieut. L. G. Payson, S. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

was devoted entirely to the reception and preparation of cases for evacuation to the United States.

The first patients were received September 22, 1917; 35,244 sick and wounded were cared for during its activity. Base Hospital No. 69 relieved Base Hospital No. 8 January 31, 1919, on which date Base Hospital No. 8 ceased to function. The unit of Base Hospital No. 8 was broken up in March, 1919, and sent to the United States in charge of convoys of patients, and was demobilized April 28, 1919, at Camp Lee, Va.

PERSONNEL

COMMANDING OFFICER

Col. J. F. Siler, M. C., July 17, 1917, to November 4, 1917.

Col. W. E. Cooper, M. C., November 5, 1917, to October 10, 1918.

Lieut. Col. R. J. Estill, M. C., October 11, 1918, to demobilization.

CHIEF OF SURGICAL SERVICE

Col. Samuel Lloyd, M. C.

Maj. C. G. Heyd, M. C.

Maj. J. F. Connors, M. C.

Maj. H. W. Orr, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. R. J. Estill, M. C.

Maj. T. A. Martin, M. C.

BASE HOSPITAL NO. 9ⁱ

Base Hospital No. 9 was organized in February, 1916, at the New York Hospital, New York City, and was mobilized July 21, 1917, at Governors Island, N. Y. After a short period of training the unit left New York August 7, 1917, on the *Finland*, and arrived at St. Nazaire, France, August 20, 1917. It remained at Savenay, quartered with Base Hospital No. 8, until September 1, 1917.

On September 2, the unit proceeded to Chateauroux, Department of Indre, in the intermediate section, its permanent station. The unit occupied a number of recently constructed buildings that had been intended for an insane asylum, but had been taken over and used by the French as a military hospital. After Base Hospital No. 9 occupied the buildings, a detachment of Engineers constructed a number of wooden wards and installed an X-ray plant. Later, when patients began to arrive in large numbers and more beds were required, the normal school of Chateauroux was taken over by the hospital. The normal capacity of the hospital was 1,926 beds, but in emergency as many as 2,250 patients were treated at one time. Base Hospital No. 9 received both surgical and medical cases, but in the spring of 1918 was designated as an orthopedic hospital. An

ⁱ The statements of fact appearing herein are based on the "History, Base Hospital No. 9 A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

18-acre farm was leased and operated by convalescent patients, which gave them a certain amount of useful training and at the same time supplied messes with staple vegetables and fresh pork. Though the first patient was admitted on September 15, 1917, the first hospital train of patients did not arrive until January 14, 1918. The hospital functioned from September 15, 1917, to January 13, 1919, when it was taken over by Base Hospital No. 63. During its activity 15,219 sick and wounded were taken care of.

The unit sailed from St. Nazaire April 14, 1919, on the *Princess Matoika*. It arrived in the United States April 27, 1919, and was demobilized at Camp Upton, N. Y.



FIG. 127.—Base Hospital No. 9, Chateauroux

PERSONNEL

COMMANDING OFFICER

Col. Arthur W. Tasker, M. C., July 1, 1917, to June 5, 1918.
 Lieut. Col. George W. Hawley, M. C., June 6, 1918, to January 18, 1919.
 Maj. J. P. Erskine, M. C., January 19, 1919, to demobilization.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Eugene H. Pool, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Edward Cussler, M. C.

BASE HOSPITAL NO. 10 ^k

Base Hospital No. 10 was organized at the Pennsylvania Hospital, Philadelphia, Pa., during February, 1917. It was mobilized at Philadelphia early in May, 1917, and on May 19 sailed from the United States on the *St. Paul*, arriving in England on May 28, 1917. After a few days' delay in England the unit was assigned to station at Le Treport (Seine Inferieure), France, arriving at that station on June 12, 1917. It was one of the original six hospitals assigned to duty with the British and operated No. 16 General Hospital, British Expeditionary Force. It remained at Le Treport, attached to the British during its entire overseas existence. It ceased to function about February 27, 1919; sailed from Brest, France, on the *Kaiserine Augusta Victoria* April 8, arrived in the United States April 17, 1919, and was demobilized shortly thereafter.

PERSONNEL**COMMANDING OFFICER**

Col. M. A. Delaney, M. C., May, 1917, to March 11, 1918.

Lieut. Col. Richard A. Harte, M. C., March 12, 1918, to November 3, 1918.

Lieut. Col. William J. Taylor, M. C., November 4, 1918, to December 24, 1918.

Lieut. Col. Charles F. Mitchell, M. C., December 25, 1918, to demobilization.

BASE HOSPITAL NO. 11 ^l

Base Hospital No. 11 was organized in July, 1916, at the St. Mary's, St. Joseph's, and Augustana Hospitals, Chicago, Ill. The unit was mobilized March 4, 1918, at the St. Mary's Hospital, Chicago, and on April 2, 1918, was transferred to Camp Dodge, Iowa, for instructions. After 11 weeks of training at the base hospital at Camp Dodge, it proceeded, on June 18, 1918, to Camp Mills, Long Island, where it remained until June 28, when it sailed from Hoboken, N. J., for Europe, on the *Matagama*. It arrived at Liverpool, England, June 10, 1918, and at Cherbourg, France, July 12, 1918. From Cherbourg, the unit proceeded by train to Nantes, Department Loire Inferieure, base section No. 1, where it arrived July 16, 1918.

Base Hospital No. 11 was the second hospital unit to arrive at Nantes, where it functioned as a part of a small hospital center. It was assigned to a type A, 1,000-bed hospital, with crisis expansion to 2,500. From July 25, when the first patients were received, to the time the hospital was relieved, it cared for 2,012 medical and 3,890 surgical cases. The greatest number of patients in hospital was on October 15, when 2,386 were being cared for.

Base Hospital No. 11 was relieved by Evacuation Hospital No. 28, on January 14, 1919, and sailed from St. Nazaire April 13, 1919, on the *Rijndam*. It arrived at Newport News, Va., April 25, and was demobilized at Camp Grant, Ill., April 29, 1919.

^k The statements of fact appearing herein are based on the "History, Base Hospital No. 10, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

^l The statements of fact appearing herein are based on the "History, Base Hospital No. 11, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

PERSONNEL

COMMANDING OFFICER

Col. F. O. McFarland, M. C., April 2, 1918, to January 20, 1919.
 Capt. I. R. Schmidt, M. C., January 21, 1919, to demobilization.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Nelson M. Percy, M. C.
 Maj. R. C. Flannery, M. C.

CHIEF OF MEDICAL SERVICE

Maj. G. F. Dick, M. C.



FIG. 128.—A general medical ward, exterior, Base Hospital No. 12, operating British General Hospital No. 18

BASE HOSPITAL NO. 12 ^m

Base Hospital No. 12 was organized in July, 1916, at the Northwestern University Medical Department, Chicago, Ill. The officers and nurses were appointed from the Mercy, Wesley, Cook County, and Evanston Hospitals; the enlisted men were recruited largely from the undergraduates of the Northwestern University. The unit was mobilized at Chicago on May 1, 1917. It left Chicago May 16, 1917, arriving in New York May 18; boarded the *Mongolia* and sailed on the following day, May 19, 1917, for Europe. During target practice May 20, two nurses accidentally were killed by shell fragments, and the ship returned to New York, reaching there May 21. The *Mongolia* sailed again on May 24 and docked at Falmouth, England, June 2.

^m The statements of fact appearing herein are based on the "History, Base Hospital No. 12, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

The unit proceeded by rail to London, whence it entrained, June 11, for Folkstone, England. From Folkstone the unit proceeded to Boulogne, France, and thence to Dannes-Camiers, Department of Seine Inferieure, where it took over the British General Hospital No. 18. The hospital was of huts and tents, with a capacity of 2,000 beds. Part of the British personnel remained long enough to enable the personnel of Base Hospital No. 12 to become familiar with the workings of a British hospital.

General Hospital No. 18 received convoys of wounded almost daily, directly from the front, until the first of the year 1918. During its active service with the British Expeditionary Force, Base Hospital No. 12 cared for 27,438 British and 2,229 American medical cases; for 30,010 British and 966



FIG. 129.—Exterior, surgical ward, Base Hospital No. 12

American surgical cases. Base Hospital No. 12 remained with the British Expeditionary Force until March 8, 1919, when it entrained for Brest, sailing thence March 26, 1919, on the *Leviathan*. It arrived in New York April 2, 1919, and was demobilized at Camp Grant, Ill., shortly afterwards.

PERSONNEL

COMMANDING OFFICER

Col. C. C. Collins, M. C., May 8, 1917, to September 1, 1918.

Maj. Martin R. Chase, M. C., September 2, 1918, to October 8, 1918.

Maj. Payson L. Nusbaum, M. C., October 9, 1918, to demobilization.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Kellog Speed, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Milton Mandell, M. C.

BASE HOSPITAL NO. 13 ⁿ

Base Hospital No. 13 was organized in July, 1916, at the Presbyterian Hospital, Chicago, Ill. On January 11, 1918, the unit was mobilized in Chicago, and proceeded January 19, 1918, to Fort McPherson, Ga., for training and equipment. The organization left Fort McPherson May 1, 1918, for Camp Merritt, N. J., and embarked May 19, on the *Saturnia* for Europe. It arrived in Le Havre, France, May 31, 1918, and proceeded on June 8 to its permanent station at Limoges, Department of Haute Vienne, base section No. 2. It arrived at Limoges June 10, and formed a part of what was to be the hospital center there.

The unit occupied 52 wooden buildings, constructed by the engineers, located in a park near the center of the city. The normal capacity of the hospital was 1,500 beds, but in October and November, 1918, it was expanded to 2,300 beds. The first patients arrived July 19, 1918; the total number cared for was 6,267, of which 3,648 were surgical and 2,619 medical cases, with 965 operations. The largest number of patients in hospital was 2,323 sick and wounded on November 13, 1918.

The hospital ceased to function on January 18, 1919, when it was relieved by Evacuation Hospital No. 32. It sailed from Bordeaux, France, March 25, 1919, on the *Wilhemina*, arriving at Camp Mills, N. Y., April 5, 1919, and was demobilized at Camp Grant, Ill., April 23, 1919.

PERSONNEL**COMMANDING OFFICER**

Col. C. P. Robbins, M. C.

CHIEF OF SURGICAL SERVICE

Lieut. Col. D. D. Lewis, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. R. C. Brown, M. C.

BASE HOSPITAL NO. 14 ^o

Base Hospital No. 14 was organized in July, 1916, at the St. Luke and Michael Reese Hospital, Chicago, Ill. The unit was mobilized March 1, 1918, at the 8th Regiment Armory, Chicago, Ill. On April 1, 1918, it was transferred to Camp Custer, Mich., for training and equipping. It left Camp Custer July 6, en route to Camp Merritt, N. J. It left New York July 15, 1918, on the *Melbourne*, arriving in Halifax, Nova Scotia, Canada, July 18, leaving there July 20, 1918. It reached Liverpool, England, July 31, and arrived at Cherbourg, France, August 3, 1918.

ⁿ The statements of fact appearing herein are based on the "History, Base Hospital No. 13, A. E. F.," by Col. C. P. Robbins, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^o The statements of fact appearing herein are based on the "History, Base Hospital No. 14, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

On August 4, the organization was ordered to Mars-sur-Allier, Department Nievre, in the intermediate section, A. E. F., where it arrived August 7, 1918. Base Hospital No. 14, was the third hospital to arrive at Mars, where it formed a part of one of the largest hospital centers in France. The unit occupied a type A hospital, and on August 20, 1918, began to receive its first patients. The normal capacity of the hospital was 2,000 beds; the largest number of patients in hospital was 1,751, on November 15, 1918. It cared for 5,534 sick and wounded, of which 3,330 were medical and 2,204 surgical cases.

On January 15, 1919, Base Hospital No. 14 was relieved by Base Hospital No. 131, and sailed from Brest April 7, 1919, on the *Graf Waldersee*, arriving in Hoboken April 20, 1919. The organization was demobilized at Camp Grant, Ill., on May 2, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. William W. Vaughan, M. C., April 22, 1918, to January 20, 1919.

Maj. Thomas L. Dagg, M. C., January 22, 1919, to March 4, 1919.

Capt. Hubert B. Blaydes, M. C., March 5, 1919, to demobilization.

CHIEF OF SURGICAL SERVICE

Maj. Samuel C. Plummer, M. C.

CHIEF OF MEDICAL SERVICE

Maj. John H. McClellan, M. C.

BASE HOSPITAL NO. 15 ^p

Base Hospital No. 15 was organized at Roosevelt Hospital, New York, N. Y., on April 12, 1917, and was mobilized at New York City in June, 1917. It sailed from New York for Europe on the *Lapland* on July 2, 1917, arriving in Europe on July 12, 1917. It was the first base hospital to arrive overseas for duty with the American Expeditionary Forces and was stationed at Chaumont, Haute Marne, France, where it arrived on July 16, 1917.

It ceased operating on January 15, 1919; sailed for the United States on the *Olympic* February 18, 1919; arrived in the United States on February 24, 1919, and was demobilized shortly thereafter.

PERSONNEL

COMMANDING OFFICER

Col. H. S. Hansell, M. C., from date of organization to June 18, 1918.

Lieut. Col. Rolfe Floyd, M. C., June 19, 1918, to February 3, 1919.

^p The statements of fact appearing herein are based on the "History, Base Hospital No. 15, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

BASE HOSPITAL NO. 17 ^a

Base Hospital No. 17 was organized in September, 1916, at the Harper Hospital, Detroit, Mich., and was mobilized there on June 28, 1917. On July 3, 1917, the organization was transferred to Allentown, Pa., leaving there July 11, for New York, where it embarked on the *Mongolia* and sailed July 13, 1917. It arrived at Southampton, England, July 24, by way of Plymouth, England, and at Le Havre, France, July 25, 1917. It remained at Le Havre until July 28, when it proceeded by rail to its final destination, Dijon, Department Cote D'or, in the advance section, arriving there July 29, 1917.

Base Hospital No. 17 was the first American organization to arrive at that station, where it functioned as an independent hospital, until January 8, 1919. At Dijon the unit was assigned the Hospital St. Ignace (French Auxilliary Hospital No. 77), then operated by the French Army. The French had about



FIG. 130.—Base Hospital No. 15, Chaumont

230 patients in the hospital when the unit arrived, the evacuation of which was not completed until August 18, 1917. It began receiving American patients on August 21, 1917, but the hospital was not officially turned over to the commanding officer until September 2, 1917.

In June 1918, when the capacity of the hospital proved inadequate, a French seminary was taken over at Plombiers, about $3\frac{1}{2}$ miles from the main hospital, and was operated as an annex. The seminary was a large stone building, of 800-bed capacity, and was used largely for convalescent and minor surgical cases.

Base Hospital No. 17 ceased to function January 8, 1919; the unit sailed from St. Nazaire April 14, 1919, on the *Princess Matoika*, arriving at Newport News, Va., April 27, 1919, and was demobilized at Camp Custer, Mich., May 9, 1919.

^a The statements of fact appearing herein are based on the "History, Base Hospital No. 17, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

PERSONNEL

COMMANDING OFFICER

Col. Henry C. Coburn, M. C., June 6, 1917, to May 12, 1918.

Col. Angus McLean, M. C., May 13, 1918, to March 24, 1919.

Maj. Thomas K. Gruber, M. C., March 25, 1919, to demobilization.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Henry N. Torrey, M. C.

CHIEF OF MEDICAL SERVICE

Maj. George E. McKean, M. C.



FIG. 131.—Base Hospital No. 17, Dijon

BASE HOSPITAL NO. 18

Base Hospital No. 18 was organized in November, 1916, at Johns Hopkins Hospital, Baltimore. The unit was mobilized May 24, 1917, at Baltimore, and on June 6, proceeded to New York for transportation to Europe. The organization embarked on the *Finland* June 9, 1917. The transport remained in the harbor until June 13, when it left en route to St. Nazaire, arriving there June 28, 1917. On June 30, the unit proceeded to Savenay, Department Loire Inferieure, where it was quartered in the normal-school building of Savenay, and while waiting for assignment to a station underwent a certain amount of military training. Part of the unit was detached on July 5 and sent to St.

* The statements of fact appearing herein are based on the "History, Base Hospital No. 18, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

Nazaire, where it took over and operated a hospital, which at first was known as United States Army Hospital No. 1 and later was designated as Base Hospital No. 101.

Toward the end of July, 1917, the unit proceeded to Bazoilles sur Meuse, Department of Vosges, in the advance section, where it arrived July 26, 1917. Base Hospital No. 18 was the first hospital unit to arrive at that station and was the farthest advanced hospital in the American Expeditionary Forces at that time. It functioned independently until July 1, 1918, when it became a part of a large and very important hospital center. At Bazoilles, the unit took over from the French Medical Department an estate comprising a stone hunting lodge, several groups of stone outbuildings, and a 25-acre tract of forested land. A number of frame buildings were erected, with a total bed capacity of 1,000, which later was increased by tent expansion to 1,300 beds.

Base Hospital No. 18 operated an optical and ophthalmological department. It was designated as a special hospital for chest and abdominal surgical cases, and received all contagious disease cases coming to the center.

During its active service, August 1, 1917, to January 9, 1919, the hospital treated a total of 14,179 medical and surgical cases.

Among the enlisted men of the unit were 32 third-year medical students, who completed their last scholastic year in France, received their degrees, and commissions in the Medical Reserve Corps.

On January 9, 1919, the hospital turned over its patients and property to Provisional Hospital No. 1, and left for St. Nazaire January 12, 1919. On January 31, 1919, the organization boarded the *Finland* at St. Nazaire and arrived in New York February 14, 1919. On February 25, 1919, it was demobilized at Camp Upton, Long Island, N. Y., and thus the Johns Hopkins unit ceased to exist.

PERSONNEL

COMMANDING OFFICER

Col. J. D. Heysinger, M. C., June 7, 1917, to August 18, 1917.

Col. George M. Edwards, M. C., August 19, 1917, to July 14, 1918.

Lieut. Col. H. H. Van Kirk, M. C., July 15, 1918, to October 19, 1918.

Maj. Bertram M. Bernheim, M. C., October 20, 1918, to December 5, 1918.

Lieut. Col. H. H. Van Kirk, M. C., December 6, 1918, to January 18, 1919.

Maj. Harvey B. Stone, M. C., January 19, 1919, to demobilization.

CHIEF OF SURGICAL SERVICE

Maj. Harvey B. Stone, M. C.

CHIEF OF MEDICAL SERVICE

Capt. C. G. Guthrie, M. C.

BASE HOSPITAL NO. 19 *

Base Hospital No. 19 was organized in March, 1916, at Rochester, N. Y., and was mobilized in the 3d Regiment Armory, that City, on December 17, 1917, where it trained for five months. On June 4, 1918, the organization left New York on the *Baltic*, arriving in Liverpool, England, June 16, 1918, and in Le Havre, France, June 18. It left Le Havre, June 20, en route to Vichy, Department of Allier, in the intermediate section, arriving there June 22, 1918. This hospital, the second hospital to arrive in Vichy, later formed a part of the hospital center there. It operated in 22 hotels and conducted 12 messes. It began receiving patients July 12, 1918. The normal capacity of the hospital was 3,629, beds, which in crisis emergency could be expanded to 4,114 beds and cots. Largest number of sick and wounded treated at one time was 3,517, on November 12, 1918. This hospital received both surgical and medical cases, the total number cared for being 11,071.

On January 20, 1919, the hospital transferred all its remaining patients and ceased to function. The unit sailed from St. Nazaire on the *Freedom*, April 13, 1919, arriving in the United States April 28, 1919, and was demobilized at Camp Upton, N. Y., on May 7, 1919.

PERSONNEL

COMMANDING OFFICER

Col. George A. Skinner, M. C., December 23, 1917, to July 19, 1918.
Lieut. Col. John M. Swan, M. C., July 20, 1918, to demobilization.

CHIEF OF SURGICAL SERVICE

Maj. Charles W. Hennington, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. William V. Evers, M.C.

BASE HOSPITAL NO. 20 †

Base Hospital No. 20 was organized in September, 1916, at the University of Pennsylvania, Philadelphia, and was mobilized November 30, 1917, at Philadelphia. It received training until April 1, 1918, when it left for Camp Merritt, N. J., where it remained, completing its equipment, until April 21, 1918. On April 24, 1918, it sailed from New York on the *Leviathan*, arriving at Brest, France, May 2, 1918. It proceeded from Brest to its final destination, Chatel Guyon, Department of Puy-de-Dome, in the intermediate section, reaching there on May 7. Chatel Guyon is a summer health resort, situated in the Auvergne Mountains, and there the unit took over various summer hotels, villas, and garages, a total of 33 buildings with a bed capacity of 2,500.

* The statements of fact appearing herein are based on the "History, Base Hospital No. 19, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

† The statements of fact appearing herein are based on the "History, Base Hospital No. 20, A. E. F.," by Lieut. Col. John B. Carnett, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

Base Hospital No. 20 was designated as one of the hospitals in the American Expeditionary Forces for the observation of suspected cases of tuberculosis. It cared for 8,706 surgical and medical cases; the greatest number of patients in hospital at one time was 2,253, on October 10, 1918. It ceased to function on January 20, 1919, all patients remaining in hospital on that date being transferred to other hospitals. The personnel left St. Nazaire on the *Freedom*, April 13, 1919, and reached New York, April 28, 1919. From New York the unit proceeded to Camp Dix, N. J., where it was demobilized on May 5, 1919.

PERSONNEL

COMMANDING OFFICER

Col. Thomas H. Johnson, M. C., November 30, 1917, to July 28, 1918.
Lieut. Col. George M. Piersol, M. C., July 29, 1918, to November 3, 1918.
Lieut. Col. John M. Carnett, M. C., November 4, 1918, to demobilization.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Eldridge L. Eliason, M. C.
Capt. John E. Kelly, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. George M. Piersol, M. C.
Maj. J. H. Musser, jr., M. C.

BASE HOSPITAL NO. 21 ^u

Base Hospital No. 21 was organized in July, 1916, at the Washington University School of Medicine, St. Louis, Mo., and mobilized April 27, 1917, at St. Louis. On May 17 it was transferred to New York; thence it sailed on the *St. Paul*, May 19, 1917. It arrived at Liverpool, England, May 28, 1917, and was assigned to duty with the British Expeditionary Forces. On June 10, the unit landed at Le Havre, France. On the following day it entrained for Rouen, Department of Seine Inferieure, where it took over and operated British General Hospital No. 12. The latter hospital had been in existence since August, 1914, and was one of the 14 hospitals and convalescent camps maintained by the British in the Rouen area. When first taken over by the American unit, the hospital practically consisted of tents; later, however, a number of Adrian type buildings and Nisson huts were erected.

The capacity of the hospital was 1,350 beds, but in October, 1918, as many as 1,950 patients were cared for at one time. It received 29,706 surgical and 31,837 medical cases. Of these, 2,833 were American, the remainder being British patients. During the German offensive operations in the spring of 1918, great numbers of wounded were received directly from the field.

The hospital ceased to function January 22, 1919, and on February 11, 1919, the personnel proceeded to Vannes (Morbihan) to await transportation to the United States. On April 7, 1919, the organization sailed from Brest on the *Graf Waldersee*, arriving in New York April 20. On May 3, 1919, it was demobilized at Camp Funston, Kans.

^u The statements of fact appearing herein are based on the "History, Base Hospital No. 21, A. E. F.," by Maj. Walter Fischel, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

PERSONNEL

COMMANDING OFFICER

Col. James D. Fife, M. C., May 12, 1917, to October 18, 1917.

Col. Fred T. Murphy, M. C., October 19, 1917, to May 15, 1918.

Lieut. Col. Borden S. Veeder, M. C., May 16, 1918, to demobilization.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Malvern B. Clompton, M. C.

Maj. W. R. Rainey, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Walter Fischel, M. C.



FIG. 132.—A view of part of Base Hospital No. 21, operating British General Hospital No. 12, Rouen

BASE HOSPITAL NO. 22 *

Base Hospital No. 22 was organized in July, 1916, at Milwaukee, Wis., and was mobilized on January 7, 1918, at the Light Horse Squadron Armory, Milwaukee, where it was trained and equipped until May 19, 1918, when it left for Camp Merritt, N. J. From May 21 until June 3, it remained at Camp Merritt, then it proceeded to New York, and embarked on the *Baltic*. It departed from New York on June 4, and arrived at Liverpool, England, June

* The statements of fact appearing herein are based on the "History, Base Hospital No. 22, A. E. F.," by Lieut. Col. Curtis A. Evans, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

16, and crossed to Le Havre, France, June 18. It left Le Havre June 20 by rail for Beau Desert, Department of Gironde, in base section No. 2, where it arrived on June 22, 1918, and was the first hospital of a group that later became the hospital center.

The hospital occupied a type A unit, with a bed capacity of 1,000, but during the stress of work in the fall of 1918 the hospital expanded to surrounding vacant units, until on November 10, 1918, 5,098 cases were under treatment. In December, 1918, this hospital was designated as a hospital for evacuations only, other hospitals in the center acting as receiving hospitals. During its activity, July 22, 1918, to January 25, 1919, this organization cared for 17,202 cases, both medical and surgical.

The unit was relieved by Evacuation Hospital No. 20, on January 25, 1919, and sailed from Bordeaux on the *Santa Marta*, February 17, 1919. It arrived in New York on March 5, 1919, and was demobilized at Camp Grant, Ill., March 16, 1919.

PERSONNEL

COMMANDING OFFICER

Col. T. J. Kirkpatrick, M. C., December 19, 1917, to July 6, 1918.

Maj. Thomas L. Gore, M. C., July 7, 1918, to January 27, 1919.

Lieut. Col. C. A. Evans, M. C., January 28, 1919, to demobilization.

CHIEF OF SURGICAL SERVICE

Lieut. Col. C. A. Evans, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Robert C. Brown, M. C.

BASE HOSPITAL NO. 23 ^w

Base Hospital No. 23 was organized in January, 1917, at the General Hospital, Buffalo, N. Y., and was mobilized at Fort Porter, N. Y., August 21, 1917, where the organization was trained and equipped. On November 21, 1917, after three months of training, the unit left Fort Porter en route to New York, arriving there November 22, 1917. It embarked on the *Carpathia* November 22, and left New York the same day en route to Europe, by way of Halifax, Canada. It arrived in Liverpool, England, December 8, 1917, and Le Havre, France, December 14, 1917. After a two days' rest at Le Havre, the unit proceeded to Vittel, Department of Vosges, in the advance section, its permanent station, arriving there December 19, 1917. It was the second hospital to arrive at Vittel, and later became a part of the hospital center there. The hospital occupied in Vittel 21 buildings, comprising hotels, villas, and garages, with a bed capacity of 1,800, which could be expanded in emergency to 2,800. The first patients were received January 8, 1918. By February 6, 1919, when the hospital ceased to function, 11,625 surgical and medical cases had been cared for.

^w The statements of fact appearing herein are based on the "History, Base Hospital No. 23, A. E. F.," by Capt. F. May, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

On February 6, 1919, all remaining patients were transferred to the hospital center at Bazoilles, and Base Hospital No. 23 ceased to function on that date. On April 20, 1919, the organization left Brest on the *Finland*, arriving in New York May 1, 1919. It was demobilized at Camp Upton, N. Y., shortly afterwards.

PERSONNEL

COMMANDING OFFICER

Col. Guy V. Rukke, M. C., August 24, 1917, to August 7, 1918.

Maj. Samuel E. Getty, M. C., August 8, 1918, to November 26, 1918.

Lieut. Col. Marshall Clinton, M. C., November 27, 1918, to January 22, 1919.

Maj. Joseph Betts, M. C., January 23, 1919, to demobilization.

CHIEF SURGICAL SERVICE

Lieut. Col. Marshall Clinton, M. C.

CHIEF MEDICAL SERVICE

Maj. Nelson G. Russell, M. C.

BASE HOSPITAL NO. 24 *

Base Hospital No. 24 was organized in January, 1917, at Tulane University, New Orleans, La., and was mobilized August 31, 1917, at Jackson Barracks, La. On September 3, 1917, the organization was transferred to Camp Greenleaf, Ga., where it was trained and equipped.

On February 16, 1918, after five months of training, the organization sailed from New York on the *Carmania*. It arrived in Liverpool, England, March 4, 1918, and proceeded by way of Southampton and Le Havre to Limoges, Department of Haute Vienne, in base section No. 2, reaching there March 15, 1918. It was the second hospital to arrive at that station, where it formed a part of a three-unit hospital center. The hospital was located in a factory plant, which previously had been occupied by Mobile Hospital No. 39. In addition to the factory plant, there were 14 wooden barracks, used as wards and as quarters. In October, 1918, the École d' Institutrices was taken over and operated as annex to Base Hospital No. 24.

The capacity of the hospital was 1,200 beds, but during the stress of work in November, 1918, this was increased to 1,740 beds by using the quarters as wards. During its activity, March 16, 1918, to January 10, 1919, 3,503 surgical and 3,858 medical cases were admitted.

The hospital ceased to function on January 10, 1919, and the personnel sailed from St. Nazaire on the *Walter A. Luckenbach*, April 9, 1919, arriving in New York April 19, 1919. The unit was demobilized at Camp Shelby, Miss., on May 3, 1919.

* The statements of fact appearing herein are based on the "History, Base Hospital No. 24, A. E. F.," by Lieut. Col. Charles E. McBrayer, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Charles E. McBrayer, M. C.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Urban Maes, M. C.

Capt. John Smyth, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. John B. Elliott, M. C.

Maj. John T. Halsey, M. C.

BASE HOSPITAL NO. 25 ^v

Base Hospital No. 25 was organized in March, 1916, at the General Hospital, Cincinnati, Ohio, and was mobilized March 7, 1918, at Camp Sherman, Ohio, where it underwent training for three months. The organization left Camp Sherman, June 19, 1918, for Camp Mills, Long Island, N. Y. It embarked June 27, 1918, on the *Lapland*, and sailed the next day for Liverpool. It arrived at Liverpool, England, July 10, 1918, and at Cherbourg, France, July 12, 1918. From Cherbourg the unit proceeded to Allerey, Department Saone et Loire, in the intermediate section, reaching there July 15, 1918. Base Hospital No. 25 was the second hospital to arrive at that station, and formed a part of what later became a large hospital center. The hospital occupied a type A unit, augmented by 36 marquée tents, bringing the capacity of the hospital to 1,750 beds. The first convoy of patients arrived July 30, 1918; the highest number of patients in hospital at one time was 1,815, in November, 1918. This hospital received all the psychoneurosis cases in the center. During its activity, July 30, 1918, to January 11, 1919, the hospital cared for 2,822 surgical and 3,038 medical cases.

The hospital ceased to function on January 11, 1919. The unit sailed from St. Nazaire for New York, April 13, 1919, on the *Freedom*. It arrived in the United States April 28, 1919, and was demobilized at Camp Taylor, Ky., May 7, 1919.

PERSONNEL

COMMANDING OFFICER

Col. Edward G. Huber, M. C., April 5, 1918, to September 13, 1918.

Lieut. Col. William Gillespie, M. C., September 14, 1918, to demobilization.

CHIEF OF SURGICAL SERVICE

Maj. Charles M. Paul, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Henry L. Woodward, M. C.

^v The statements of fact appearing herein are based on the "History, Base Hospital No. 25, A. E. F.," by Lieut. Col. William Gillespie, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

BASE HOSPITAL NO. 26 *

Base Hospital No. 26 was organized in May, 1917, at the University of Minnesota, Minneapolis, and was mobilized at Minneapolis on December 13, 1917. On December 28, 1917, the unit entrained for Fort McPherson, Ga., where it arrived on the 31st. It remained there in training until the middle of May, 1918, when it proceeded to Camp Merritt, N. J., to prepare for embarkation. It left Hoboken June 5, 1918, on the *Adriatic*, arriving in Liverpool, England, June 16, 1918, and at Le Havre, France, within a day or two. It reached Allerey, Department Saone et Loire, in the intermediate section, June 20, 1918, being the first unit to reach this station, later the location of a large hospital center. It furnished the personnel for much the greater part of the center staff.

The hospital was housed in a type A unit, augmented by a number of marquée tents, the total capacity of the hospital being 2,000 beds. The first convoy of patients arrived on July 23, and the second on July 30; the second convoy came directly from evacuation hospitals at the front and brought many wounded that had not been operated on. This hospital was designated by the commanding office of the hospital center to receive all ophthalmic cases for the center. It established a clinic for all ambulatory ocular cases of the center. During the service of this department, 818 refractions were made.

Base Hospital No. 26 ceased to function on January 10, 1919, and the organization sailed from St. Nazaire on the *Rijndam*, April 13, 1919, arriving at Newport News, Va., April 25, 1919. The entire unit was demobilized at Camp Grant, Ill., May 13, 1919.

PERSONNEL**COMMANDING OFFICER**

Col. J. H. Ford, M. C., December 17, 1917, to June 23, 1918.

Col. A. A. Law, M. C., June 24, 1918, to December 26, 1918.

Lieut. Col. John S. Staley, M. C., December 27, 1918, to demobilization.

CHIEF OF SURGICAL SERVICE

Lieut. Col. John S. Staley, M. C.

Col. A. A. Law, M. C.

Maj. E. C. Moore, M. C.

Maj. M. E. Lott, M. C.

CHIEF OF MEDICAL SERVICE

Maj. S. M. White, M. C.

Capt. David M. Berkman, M. C.

* The statements of fact appearing herein are based on the "History, Base Hospital No. 26, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

BASE HOSPITAL NO. 27^a

Base Hospital No. 27 was organized in April, 1916, at the Medical School of the University of Pittsburgh, Pa., and was mobilized at Pittsburgh, on August 18, 1917. Three days later, the unit entrained for Allentown, Pa., where it arrived August 22, 1917, and spent five weeks in training. On September 27, 1917, the unit left New York on the *Lapland*. It reached Halifax, Canada, September 29, and left the same day for Liverpool, England, reaching there October 11, 1917. From Liverpool it proceeded by rail to Southampton, arriving there October 12, and remained there in a rest camp until October 16, 1917, when it crossed the English Channel and disembarked at Le Havre, France, October 17. After spending a day in the rest camp at Le Havre, the organiza-



FIG. 133.—A view of part of the temporary buildings, Base Hospital No. 27, Angers

tion proceeded to its permanent station at Angers, Department Maine et Loire, base section No. 1, arriving there October 19, 1917. The hospital occupied the Mongazon seminary, a large three-story masonry structure, which was readily converted into a hospital. In addition, numerous wards of wooden construction were erected; these wards were of the Grandum (frame) type and of the Bessonneau (frame plastered) type. In August 1918, the Grand Séminaire, a large modern three-story building, was taken over and operated as an annex for the treatment of convalescing patients. The hospital began to receive patients November 9, 1917. Its normal capacity was 2,800 beds; and in emergencies this was expanded to 4,100. This expansion extended into a number of marquée tents.

^a The statements of fact appearing herein are based on the "History, Base Hospital No. 27, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

During the week ending October 17, 1918, Angers was designated a hospital center; however, it was not until after the armistice was signed that Provisional Base Hospital No. 1 was organized there, from personnel comprising Base Hospital No. 27.

The hospital cared for 19,522 patients; of these 10,455 were medical and 9,067 surgical cases.

On January 5, 1919, Base Hospital No. 27 was relieved by Base Hospital No. 85, and on March 14, 1919, sailed from St. Nazaire on the *Manchuria*, and arrived at New York November 24. It was demobilized at Camp Dix, N. J., March 25, 1919.



FIG. 134.—Base Hospital No. 28, part of Limoges hospital center

PERSONNEL

COMMANDING OFFICER

Col. Royal Reynolds, M. C., July, 1917, to January 8, 1919.

Maj. Stanley S. Smith, M. C., January 9, 1919, to demobilization.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Robert T. Miller, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. J. D. Heard, M. C.

BASE HOSPITAL NO. 28^b

Base Hospital No. 28 was organized in April, 1917, at the Christian Church Hospital, Kansas City, Mo., and was mobilized January 21, 1918, at Kansas City, Mo., where it received its preliminary training and equipment. On February 23, 1918, the organization was transferred to Fort McPherson, Ga., where it continued its training at General Hospital No. 6. On June 2, 1918, the organization left for Camp Merritt, N. J., arriving there June 4, 1918, and sailed on the *Meganic*, June 12, 1918. It disembarked at Liverpool, England, June 25, and proceeded immediately to Southampton, leaving there June 28 for Cherbourg, France. It arrived at Limoges, Department of Haute Vienne, base section No. 2, on July 2, 1918. It was the third and last hospital to report at the Limoges hospital center. The unit occupied a type A hospital and also took over from the French a large school building, the Belaire Seminary. The normal capacity of the hospital was 1,780 beds, which in emergency was increased to 2,965. The first patients were received July 23; the total number received was 9,954, of which 6,087 were medical and 3,867 surgical cases.

On February 1, 1919, Base Hospital No. 28 was relieved by Base Hospital No. 98, and on April 19, 1919, it returned to the United States on the *Mercury*, from St. Nazaire. It arrived in the United States on April 30, and was mustered out of the service at Camp Dix, N. J., on May 2, 1919.

PERSONNEL**COMMANDING OFFICER**

Col. William B. Banister, M. C., February 22, 1918, to July 15, 1918.
Lieut. Col. Lindsay S. Milne, M. C., July 16, 1918, to demobilization.

CHIEF OF SURGICAL SERVICE

Lieut. Col. J. F. Binnie, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. George H. Hoxie, M. C.

BASE HOSPITAL NO. 29^c

Base Hospital No. 29 was organized at City and County Hospital, Denver, Colo., on April 5, 1917, and was mobilized at Camp Cody, N. Mex., during March, 1918. The unit trained at Camp Cody and at Camp Crane, Allentown, Pa., until July 5, 1918, when it left for Hoboken, N. J., arriving there on July 6, 1918, when it embarked on the *Empress of Russia*, and sailed the same date for Europe. The unit arrived in England on July 17, 1918, and was assigned to duty at North Eastern Fever Hospital, London, where it arrived on the night of July 19, 1918. It took over the hospital from the British on August 1, 1918. The hospital cared for 3,976 cases, of which 2,351 were surgical and 1,625 were medical.

^b The statements of fact appearing herein are based on the "History, Base Hospital No. 28, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed*.

^c The statements of fact appearing herein are based on the "History, Base Hospital No. 29, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed*

Base Hospital No. 29 ceased operating on January 12, 1919; sailed for the United States on the *Olympic*, February 18, 1919; arrived in the United States on February 24, 1919, and was demobilized at Fort Logan, Colo., on March 13, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. John B. Anderson, M. C.

CHIEF OF SURGICAL SERVICE

Maj. Edward F. Dean, M. C.

Capt. Robert Ferguson, M. C.



FIG. 135.—Surgical building, Base Hospital No. 29

CHIEF OF MEDICAL SERVICE

Maj. John M. Amesse, M. C.

Maj. William W. Williams, M. C.

BASE HOSPITAL NO. 30^d

Base Hospital No. 30 was organized in March, 1917, at the University of California, San Francisco, and was mobilized November 20, 1917, at Fort Mason, Calif. After three months of training and equipping the organization sailed from Fort Mason, March 1, 1918, on the *Northern Pacific* for New

^d The statements of fact appearing herein are based on the "History, Base Hospital No. 30, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

York via Panama, arriving at New York March 17. The unit remained at Camp Merritt, N. J., until April 22, when it embarked at Hoboken on the *Leviathan* and sailed April 24. It arrived at Brest, France, May 2, 1918, and at Royat, Department Puy de Dome, in the intermediate section, May 7.

Royat is a small town situated in the Auvergne Mountains, and is a popular health and watering resort. There was no other hospital at Royat, and until shortly before the armistice Base Hospital No. 30 functioned independently. For a short time it was a part of the Clermont-Ferrand hospital center. The hospital occupied 16 hotels and a garage, with a total normal bed capacity of 2,400. Difficulty was experienced with the sewerage system; all buildings were dependent on cesspools, which on account of shortage of wagons and men



FIG. 136.—Airplane view, Base Hospital No. 30, Royat

could not be emptied as often as required. Cesspools were located directly under the buildings and, when they overflowed, flooded the basements and kitchens.

The first patients were received on June 12; the total number of cases treated in hospital from June 12, 1918, to January 20, 1919, was 7,562, of which 2,415 were surgical and 5,147 medical cases.

On January 20, 1919, all remaining patients were transferred and Base Hospital No. 30 ceased to function on that date. The unit was transferred to St. Nazaire, whence it sailed on April 13, 1919, on the *Freedom*, for the United States. Upon arrival in the United States on April 28 the organization was ordered to Presidio of San Francisco, Calif., where it arrived on May 15 and was demobilized on May 26, 1919.

PERSONNEL

COMMANDING OFFICER

Col. Elmer A. Dean, M. C., November 21, 1917, to June 15, 1918.
Lieut. Col. E. S. Kilgore, M. C., June 16, 1918, to November 11, 1918.
Maj. Alanson Weeks, M. C., November 12, 1918, to November 22, 1918.
Col. L. D. Carter, M. C., November 23, 1918, to demobilization.

CHIEF OF SURGICAL SERVICE

Maj. Alanson Weeks, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. E. S. Kilgore, M.C.

BASE HOSPITAL NO. 31*

Base Hospital No. 31 was organized March 26, 1917, at the Youngstown City Hospital, Youngstown, Ohio, and was mobilized at Youngstown, September 7, 1917. On September 8, it entrained for Camp Crane, Allentown, Pa., to undergo training and equipping. It remained in training at Camp Crane until November 21, 1917, when it was transferred to Camp Mills, Long Island, where it remained until December 14, 1917, preparing for embarkation. It sailed from New York on the *Leviathan*, on December 15; arrived at Liverpool, England, on December 25 and at Le Havre, France, December 26. After three days at the Le Havre rest camp, the unit entrained December 30 for Contrexeville, Vosges, in the advance section, arriving there January 1, 1918. Contrexeville was one of the two towns comprising the Vittel-Contrexeville hospital center. Base Hospital No. 31 was the fourth and last hospital to arrive at Contrexeville, which, like Vittel, is a summer health resort, with numerous hotels; eight of these were assigned to Base Hospital No. 31.

Because of the numerous changes in buildings that had to be made, and of the nonarrival of equipment, the hospital did not begin to function until March 23, 1918, when the first patients were received. The normal capacity of the hospital was 1,200 beds; the crisis expansion, 2,000 beds. One ward of this hospital contained 250 beds. The largest number of patients in hospital was 1,786 on October 18, 1918. The hospital treated 3,413 medical and 4,585 surgical cases.

On February 3, 1919, all remaining patients were transferred and Base Hospital No. 31 was officially closed. The unit proceeded to St. Nazaire, whence it sailed on the *Mercury*, April 19, 1919. It arrived in the United States on April 30, 1919, and was demobilized at Camp Dix, N. J., May 2, 1919.

* The statements of fact appearing herein are based on the "History, Base Hospital No. 31, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

PERSONNEL

COMMANDING OFFICER

Col. Adam E. Schlanser, M. C., August 30, 1917, to June 16, 1918.
Lieut. Col. Colin R. Clark, M. C., June 17, 1918, to July 18, 1918.
Maj. A. E. Brant, M. C., July 19, 1918, to September 30, 1918.
Maj. John L. Washburn, M. C., October 1, 1918, to November 24, 1918.
Lieut. Col. J. A. Sherbondy, M. C., November 25, 1918, to January 2, 1919.
Maj. John L. Washburn, M. C., January 3, 1918, to demobilization.

CHIEF OF SURGICAL SERVICE

Lieut. Col. J. A. Sherbondy, M. C.
Lieut. Col. E. S. Van Duyn, M. C.
Maj. A. E. Brant, M. C.
Maj. C. E. Coon, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Colin R. Clark, M. C.
Maj. C. C. Wolferth, M. C.

BASE HOSPITAL NO. 32

Base Hospital No. 32 was organized in February, 1917, at Indianapolis, Ind., and was mobilized at Fort Benjamin Harrison, Ind., September 1, 1917. After three months of training and equipping there, the unit left December 1, 1917, for Hoboken, N. J. It embarked on the *George Washington*, December 3, and sailed the following day for Brest, France, arriving there December 21. After three days rest, the unit left for Contrexeville, Vosges, advance section, where it arrived on December 26, 1917. Eight hotels were assigned to Base Hospital No. 32; various other buildings were used as warehouses, etc. Because numerous changes had to be made in these hotels, the unit did not begin to function until March 23, 1918, when the first convoy of patients was received. This organization was the first to arrive at Contrexeville, but third to arrive in the Vittel-Contrexeville group. The normal bed capacity was 1,300, which in emergency was increased to 1,900. During its activity, March 23, 1918, to January 12, 1919, the hospital cared for 9,698 medical and surgical cases.

The hospital was officially closed on January 12, 1918. The unit then was transferred to St. Nazaire for transportation to the United States. It sailed April 13, 1919, on the *Freedom* and was demobilized at Camp Taylor, Ky., May 7, 1919.

PERSONNEL

COMMANDING OFFICER

Maj. Harry R. Beery, M. C., August 27, 1917, to March 1, 1918.
Lieut. Col. Edmund D. Clark, M. C., March 2, 1918, to March 6, 1918.
Lieut. Col. H. H. Van Kirk, M. C., March 7, 1918, to July 14, 1918.
Lieut. Col. Edmund D. Clark, M. C., July 15, 1918, to January 14, 1919.
Maj. James F. Clark, M. C., January 15, 1919, to demobilization.

/ The statements of fact appearing herein are based on the "History, Base Hospital No. 32, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Edmund D. Clark, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Bernays Kennedy, M. C.

BASE HOSPITAL NO. 33^a

Base Hospital No. 33 was organized in June, 1917, at the Albany Hospital, Albany, N. Y., and was mobilized November 19, 1917, at Troop B Armory, Albany, N. Y., where it remained in training for five months. On April 26,



FIG. 137.—Base Hospital No. 33, Portsmouth, England

1918, the organization entrained for Camp Merritt, N. J., where it remained until May 2. It embarked May 3 on the *Carmania*, leaving the same day for Liverpool, England, where it arrived May 16, 1918. It left immediately for the rest camp at Knotty Ash, where it remained for two days and was then transferred to the American rest camp, Winnall Down, Winchester. At Winnall Down the unit remained awaiting permanent assignment until June 3, 1918. The majority of the personnel during this time were assigned to duty in hospitals and camps in England. On June 3 the unit was assigned

^a The statements of fact appearing herein are based on the "History, Base Hospital No. 33, A. E. F.," by Lieut. Col. Erastus Corning M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

station at Portsmouth, England, and took over a portion of the Fifth Southern General Hospital, known as Fawcett Road section. On July 8, 1918, the unit was transferred to the Portsmouth Borough Asylum, which was in greater readiness for immediate use. The asylum buildings were of modern construction, brick and stone, in the center of an 83-acre tract, and were capable of housing 1,000 patients.

The capacity of the hospital was to be increased by construction of additional wards, about 70 in number. These buildings were about 35 per cent complete on November 23, 1918, when orders were received to abandon further construction. On August 5, 1918, the chief surgeon, A. E. F., designated Base Hospital No. 33 a special hospital for war neuroses; 160 of these cases were handled by this hospital. The first patients were received on July 24, 1918; largest number of sick and wounded in hospital was on November 17, 1918, when 1,586 were being cared for. From July 24 to December 31, 1918, the hospital treated 1,782 medical and 1,765 surgical cases.

On January 1, 1919, all remaining patients were evacuated and the hospital ceased to function on that date. The unit sailed from Brest February 18, 1919, on the *Olympic*. It arrived in New York February 24, 1919, and was demobilized at Camp Upton, N. Y., March 5, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Alleyne von Schrader, M. C., September, 1917, to August 2, 1918.

Lieut. Col. Erastus Corning, M. C., August 3, 1918, to demobilization.

CHIEF OF SURGICAL SERVICE

Maj. A. W. Elting, M. C.

Maj. Charles G. McMullen, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Clinton B. Hawn, M. C.

BASE HOSPITAL NO. 34 ^h

Base Hospital No. 34 was organized in April, 1917, at the Episcopal Hospital, Philadelphia, Pa., and was mobilized there on September 7, 1917. On September 8, the organization proceeded to Camp Crane, Allentown, Pa., where it was trained and equipped. On November 21, the unit was transferred to Camp Mills, Long Island, N. Y., to await transportation abroad. It embarked December 14 on the *Leviathan*, leaving New York the next day for Liverpool, England, where it arrived December 25, 1917. It proceeded from Liverpool by rail to Southampton and crossed the channel on the night of December 25, arriving in Le Havre, France, December 26. From Le Havre the unit was sent to Blois, France, for further orders; from there it was as-

^h The statements of fact appearing herein are based on the "History, Base Hospital No. 34, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

signed to its permanent station at Nantes, Loire Inferieure, in base section No. 1. It arrived at Nantes January 8, 1918, and took over Grand Séminaire, a four-story brick structure, which before the war had been used as a Catholic seminary. In addition to this, numerous wooden buildings were erected, and later when more space was required a normal-school building was leased and opened October 19, 1918. This latter addition was used as an annex for sick and wounded officers.

Of the four hospitals that formed the Nantes hospital center, Base Hospital No. 34 was the first to arrive. It acted independently until July 29, 1918, when the hospital center was organized. The first patients were received April 2, 1918; from then until January 16, 1919, 9,080 sick and wounded were treated. The normal capacity of the hospital was 1,300 beds; the largest number of patients in hospital was 1,527 on November 6, 1918.

On January 16, 1919, Evacuation Hospital No. 36 relieved Base Hospital No. 34. The unit of Base Hospital No. 34 sailed from St. Nazaire on the *Walter A. Luckenbach*, April 9, 1919. It arrived in the United States April 19, 1919, and was demobilized at Camp Dix, N. J., April 27, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Ralph G. DeVoe, M. C.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Emory G. Alexander, M. C.

CHIEF OF MEDICAL SERVICE

Maj. John B. Carson, M. C.

Capt. W. H. Long, M. C.

Maj. Oliver H. P. Pepper, M. C.

Maj. Charles Fife, M. C.

BASE HOSPITAL NO. 35¹

Base Hospital No. 35 was organized in April, 1917, at the Good Samaritan Hospital, Los Angeles, Calif., and was mobilized in Los Angeles, Calif., March 14, 1918. The organization trained and was equipped at Camp Kearny, Calif., until July 4, 1918, on which date it left for Camp Merritt, N. J., arriving there July 9. On July 15, 1918, it sailed from New York on the *Port Melbourne*, arriving at England, July 31, 1918, and at Le Havre, France, August 7. It entrained August 7 for Mars-sur-Allier, Department of Nièvre, in the intermediate section, arriving there August 10, 1918.

Base Hospital No. 35 was the fourth unit to arrive in Mars, and became a part of one of the largest and important hospital centers in the American Expeditionary Forces. The organization occupied a set of type A wooden barracks, and began to receive patients on September 2, 1918, over 500 being

¹ The statements of fact appearing herein are based on the "History, Base Hospital No. 35, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

admitted on that day. Its normal bed capacity was 2,000, but as many as 2,800 sick and wounded were taken care of at one time. During its activity, September 2, 1918, to January 15, 1919, the hospital cared for 3,401 medical and 3,117 surgical cases, with 500 operations.

On January 15, 1919, Evacuation Hospital No. 30 relieved Base Hospital No. 35, the latter organization leaving February 14 for St. Nazaire to await transportation to the United States. .

The unit sailed from St. Nazaire April 13, on the *Rijndam*, arriving in Newport News, April 25, and was demobilized at Camp Kearny, Calif., May 6, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Geo. F. Lull, M. C., June 5, 1918, to January 14, 1919.

Maj. J. A. Van Kaathoven, M. C., January 15, 1919, to February 13, 1919.

Maj. Eliot Alden, M. C., February 14, 1919, to May 6, 1919.

CHIEF OF SURGICAL SERVICE

Maj. J. A. Van Kaathoven, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Charles R. Sowder, M. C.

Capt. George C. Hunter, M. C.

BASE HOSPITAL NO. 36¹

Base Hospital No. 36 was organized in April, 1917, at the Detroit College of Medicine, Detroit, Mich., and was mobilized at Detroit, August 23, 1917. The unit remained in training there for two months and sailed from New York on the *Orduna*, October 27, 1917, arriving in France on November 11, 1917, and at Vittel, its permanent station, on November 17. It was the first unit to arrive at Vittel, later forming a part of the Vittel-Contrereville hospital center. It occupied 16 hotels and villas and had a total bed capacity of 1,650. The first patients were received December 8, 1917. During its activity, December 8, 1917, to January 14, 1919, the hospital cared for 14,114 medical and surgical cases, of which 1,376 were allied sick and wounded.

On January 14, 1919, all remaining patients were evacuated and the hospital ceased to function. The unit sailed from St. Nazaire, April 13, 1919, on the *Rijndam*, arriving at Newport News, Va., April 25, 1919, and was demobilized at Camp Custer, Mich., May 4, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Hiram A. Phillips, M. C., April 19, 1917, to September 13, 1918.

Lieut. Col. B. R. Shurly, M. C., September 14, 1918, to January 22, 1919.

Lieut. Col. Henry G. Berry, M. C., January 23, 1919, to May 4, 1919.

¹ The statements of fact appearing herein are based on the "History, Base Hospital No. 36, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

CHIEF OF SURGICAL SERVICE

Maj. Frank B. Walker, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Theodore A. McGraw, M. C.

BASE HOSPITAL NO. 37 ^k

Base Hospital No. 37 was organized in July, 1917, at the Kings County Hospital, Brooklyn, N. Y. On January 4, 1918, the unit was called into active service and mobilized at the Twenty-third Regiment Armory, Brooklyn, N. Y., later moving to the Fourteenth Regiment Armory, that city. On May 19, 1918, it left the port of New York on the *Lapland*, arriving in Liverpool, England, on May 31. On June 1 it proceeded to the American Rest Camp at Southampton, and on June 5 it left Rest Camp for Camp Efford, Plymouth, England, which was to be its permanent station. It was ordered on July 18, 1918, to proceed to Dartford, Kent, England, for station, where it occupied a large hospital controlled by the British metropolitan asylums board.

The normal capacity of the hospital was 2,000 beds, but during November, 1918, tents had to be erected to accommodate the large number of patients that were being admitted at that time. During its activity the hospital cared for 3,111 surgical and 1,239 medical cases. On January 21, 1919, all remaining patients were evacuated and the hospital was closed. The unit sailed from Brest, France, on the *Olympic*, February 18, 1919. It arrived in New York February 24, and was demobilized at Camp Upton, N. Y., March 5, 1919.

PERSONNEL

COMMANDING OFFICER

Col. B. H. Dutcher, M. C., December 13, 1917, to July 6, 1918.

Col. E. H. Fiske, M. C., July 7, 1918, to March 5, 1919.

CHIEF OF SURGICAL SERVICE

Col. E. H. Fiske, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Henry M. Moses, M. C.

BASE HOSPITAL NO. 38 ^l

Base Hospital No. 38 was organized in April, 1917, at the Jefferson Medical College, Philadelphia, Pa., and was mobilized October 15, 1917, at Philadelphia, Pa., where it remained in training until June 21, 1918. The unit embarked on the *Nopatkin*, from Hoboken, June 22 and arrived at Brest.

^k The statements of fact appearing herein are based on the "History, Base Hospital No. 37, A. E. F.," by 1st Lieut. Arthur Springer, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.— *Ed.*

^l The statements of fact appearing herein are based on the "History, Base Hospital No. 38, A. E. F.," by the commanding officer of the hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.— *Ed.*

France, June 5, 1918. It arrived at Nantes, Loire Inferieur, base section No. 1, July 11, 1918, and occupied a set of wooden type A barracks. Base Hospital No. 38 was the second unit to arrive at Nantes, where it later formed a part of the hospital center there.

The hospital began receiving patients 11 days after its arrival. The normal bed capacity was 1,000, but during an emergency, when as high as 2,413 cases were under treatment, a number of ward buildings of an adjoining, unoccupied hospital were taken over. It received both medical and surgical cases; the total number treated during its activity, July 22, 1918, to January 26, 1919, was 7,434.

On January 25, 1919, Evacuation Hospital No. 31 relieved Base Hospital No. 38. The latter organization sailed from St. Nazaire on the *Freedom*, April 13, 1919, and arrived in the United States April 28, 1919. The unit was demobilized at Camp Dix, N. J., on May 7, 1919.

PERSONNEL

COMMANDING OFFICER

Col. John S. Lambie, M. C., September 20, 1917, to September 2, 1918.

Lieut. Col. John E. Lowman, M. C., September 3, 1918, to February, 1919.

Maj. John R. Forst, M. C., February, 1919, to May 7, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Charles F. Nassau, M. C.

CHIEF OF MEDICAL SERVICE

Col. William M. L. Coplin, M. C.

BASE HOSPITAL NO. 39

Base Hospital No. 39 was changed to Mobile Hospital No. 39, soon after its arrival in France, and never functioned as a base hospital. Since it operated with troops at the front, its activities are recorded in Volume VIII (p. 191) of this history.

BASE HOSPITAL NO. 40 ^m

Base Hospital No. 40 was organized in June, 1917, at the Good Samaritan Hospital, Lexington, Ky., and was mobilized there February 23, 1918. March 1, 1918, it was transferred to Camp Taylor, Ky., where the personnel were assigned to the local base hospital for training until June 18. On that date, the organization entrained for Camp Mills, N. Y. It embarked at Hoboken, N. J., July 6, and sailed the same day on the *Scotian*, arriving at Glasgow, Scotland, July 17. It proceeded from Glasgow by train to the American rest camp at Southampton, England, arriving July 19, and leaving July 22 for Sarisbury Court, England, its permanent station. Upon arrival there a majority of the personnel were detached and assigned to duty in English and American hospitals in England and France. The unit was scattered and never at any time functioned as a whole. At Sarisbury Court the remainder of the organi-

^m The statements of fact appearing herein are based on the "History, Base Hospital No. 40, A. E. F.," by Lieut. Col. David Barrow, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

zation took over a mansion house of about 170-bed capacity and converted it into a hospital. Patients were not received until September 27, 1918. Additional wards were being built, but after the signing of the armistice, all construction was stopped. The normal bed capacity was 500, but on December 31, 1918, there were available 800 beds. The operating room, laboratory, and X-ray plant were not completed until December. The total number of sick and wounded treated in this hospital was 1,300.

Base Hospital No. 40 ceased to function on February 24, 1919, and the organization sailed from Brest, France, on the *Aquitania*, March 23, 1919. It arrived in New York March 30, and was demobilized at Camp Taylor, Ky., April 16, 1919.



FIG. 138.—Contagious disease ward, Base Hospital No. 40, Sarisbury Court, Hants, England

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Leonard S. Hughes, M. C., March 26, 1918, to February 25, 1919.

Lieut. Col. David Barrow, M. C., February 26, 1919, to April 16, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. David Barrow, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Julian T. McClymonds, M. C.

BASE HOSPITAL NO. 41 ⁿ

Base Hospital No. 41 was organized in August, 1917, at the University of Virginia, Charlottesville, and was mobilized there February 26, 1918. On March 5, 1918, the organization proceeded to Camp Sevier, S. C., where it was trained at the camp base hospital for three months. On June 18, the unit proceeded to Camp Mills, N. Y. It sailed for Europe July 6, on the *Scotian*; arrived at Glasgow, Scotland, July 17; departed the following day by rail for Southampton, England; sailed for Le Havre, France, July 22; and left the latter port by rail for Paris on July 23.

The hospital arrived in Paris July 25, 1918, and was assigned to station at St. Denis, Seine, occupying the buildings and grounds of the l'École de la



FIG. 139.—A view of the grounds, Base Hospital No. 41, St. Denis, Paris

Legion d'Honneur, where it functioned under the jurisdiction of the surgeon of the district of Paris. The school was converted into a hospital of 1,000-bed capacity and began receiving patients on August 16, 1918. Later the capacity of the hospital was increased by the construction of a number of wooden barracks and the erection of 52 marquee and 13 double Bessonneau tents; the chapel and hallways of the school were also converted into wards. With these additions the capacity of the hospital was increased to 2,900 beds. During its activity, August 16, 1918, to January 28, 1919, this hospital cared for 4,695 sick and wounded. From August 16, 1918, to October 7, 1918, it acted largely as an evacuation hospital, receiving patients directly from the front, where only first-aid treatment had been administered to them.

ⁿ The statements of fact appearing herein are based on the "History, Base Hospital No. 41, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

Base Hospital No. 41 ceased to function January 28, 1919; the unit sailed from St. Nazaire April 13, 1919, on the *Rijndam*, arriving in New York April 25, 1919, and was demobilized at Camp Lee, Va., May 7, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. J. M. Cabell, M. C., February 26, 1918, to May 7, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. William H. Goodwin, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Herbert Old, M. C.

BASE HOSPITAL NO. 42 *

Base Hospital No. 42 was organized in June, 1917, at the University of Maryland, Baltimore, Md., and on April 1, 1918, was mobilized at Camp Meade, Md., where it was trained and equipped. On June 20, 1918, the organization entrained for Camp Mills, N. Y., remaining there until June 27, 1918. On June 28, it left Hoboken, N. J., on the *Metagama*, for Liverpool, England. Arriving there July 10, it entrained immediately for Southampton; crossed the English Channel on the night of July 11; reached Cherbourg France, July 12; entrained the following day for Bazoilles-sur-Meuse, Department of Vosges, in the advance section, and arrived there on July 15, 1918. This was the fifth hospital to arrive at Bazoilles, where it became a part of the large hospital center there. The organization occupied one type A unit, which was nearly completed, and began receiving patients on July 19. This hospital was designated by the commanding officer of the center as a special hospital for maxillofacial cases; it received also all cases of mumps and measles. The normal capacity of the hospital was 1,000 beds; but with crisis expansion in marquee tents, this was increased to 2,000 beds. During its period of activity, July 19, 1918, to January 8, 1919, the hospital treated 2,593 surgical and 4,559 medical cases.

On January 8, 1919, Evacuation Hospital No. 21 relieved Base Hospital No. 42; the latter organization proceeding on January 28 to the port of embarkation; sailed from St. Nazaire on the *Santa Paula*, April 8, 1919. It arrived in New York April 20, 1919, and was demobilized at Camp Meade, Md., May 2, 1919.

PERSONNEL

COMMANDING OFFICER

Col. Howard H. Johnson, M. C., April 1 to August 19, 1918.

Lieut. Col. A. C. Harrison, M. C., August 20, 1918, to May 2, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. A. C. Harrison, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Carey B. Gamble, M. C.

Capt. David C. Streett, M. C.

* The statements of fact appearing herein are based on the "History, Base Hospital No. 42, A. E. F., by Lieut. Col. Archibald C. Harrison, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

BASE HOSPITAL NO. 43 ^p

Base Hospital No. 43 was organized in June, 1917, at the Emory University, Atlanta, Ga., and was mobilized March 4, 1918, at Camp Gordon, Ga. After three months of training and equipping, the command left Camp Gordon for Camp Merritt, N. J., arriving there June 4, 1918. On June 14 the unit embarked on the *Olympic*, leaving the same day for Southampton, England, arriving there on June 21. It crossed the English Channel the night of June 23; reached Le Havre, France, June 24; entrained at Le Havre, June 26, for Blois, Department Loire at Cher, in the intermediate section, and arrived at Blois on June 27. On July 3, it relieved Camp Hospital No. 25, and took over seven buildings that had been operated as a hospital by the latter organiza-



FIG. 140.—View of part of Base Hospital No. 43, Blois

tion. The buildings were widely scattered through the city, which necessitated the use of a greater number of personnel than would have been necessary otherwise. Each building functioned as a separate hospital, subject to the commanding officer, with definite commissioned and enlisted personnel and its quota of female nurses; but all patients arriving at the hospital passed through a main receiving ward.

When first taken over, the hospital had a normal bed capacity of 1,000 and an emergency capacity of 1,397. In September and October, 1918, several additional buildings were taken over from the French, and the normal capacity

^p The statements of fact appearing herein are based on the "History, Base Hospital No. 43, A. E. F." by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

was increased to 2,025 beds; emergency expansion to 2,300 beds. For a time this hospital was used as a depot for casual nurses. During its period of activity, July 3, 1918, to January 20, 1919, 5,263 cases of disease and 4,002 of injury were treated.

On January 20, 1919, Evacuation Hospital No. 35 relieved Base Hospital No. 43, the latter organization leaving for the United States from St. Nazaire on March 12 on the *Kroonland*. It arrived at Newport News, Va., March 24, and was demobilized at Camp Gordon, Ga., shortly afterwards.

PERSONNEL

COMMANDING OFFICER

Col. S. U. Marietta, M. C., April 2, 1918, to January 31, 1919.

Col. Clyde S. Ford, M. C., February 1 to February 26, 1919.

Maj. John L. Haskins, M. C., February 27, 1919, to demobilization.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Frank K. Boland, M. C.

CHIEF OF MEDICAL SERVICE

Maj. John L. Haskins, M. C.

BASE HOSPITAL NO. 44 *

Base Hospital No. 44 was organized in March, 1917, at the Massachusetts Homeopathic Hospital, Boston, Mass., and was mobilized at Boston March 10, 1918. On March 12, it was transferred to Camp Dix, N. J., where it remained in training for four months. On July 6, the organization left Hoboken, N. J., on the *Ulysses* for Liverpool, England, and arrived there on July 17. The following day the command entrained for Southampton, arriving there on July 19. The English Channel was crossed on the night of July 22, and Le Havre, France, reached on July 23. On July 24 the unit proceeded by train to its final destination, Pougues-les-Eaux, Department of Nièvre, in the intermediate section, and arrived on July 26. Upon arrival at Pougues, the unit took over a number of hotels and various other buildings in that city and converted them into a hospital, although a great many alterations were necessary before they could be used as a hospital. The first patients were received on August 10.

This hospital functioned as a part of the Mesves hospital center, which was about 11 miles distant. On December 16, 1918, the hospital plant at Pougues was abandoned and the unit transferred to Mesves, where it occupied a set of type A barracks. The normal bed capacity of the hospital while at Pougues was 1,000, with an emergency expansion to 1,750. The largest number of patients under treatment at one time was in October, when 1,712 were being cared for. After its transfer to Mesves, the capacity of the hospital was reduced to 1,000 beds. Base Hospital No. 44 received both surgical and medical cases; a total of 3,681 sick and wounded were admitted during its period of activity.

* The statements of fact appearing herein are based on the "History, Base Hospital No. 44, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

On January 18, 1919, Evacuation Hospital No. 29 relieved Base Hospital No. 44. The latter organization returned to the United States from Brest April 7, 1919, on the *Graf Waldersee*; arrived in New York April 20, 1919, and was demobilized at Camp Devens, Mass., on May 2, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Robert H. Wilds, M. C., March 10, 1918, to February 1, 1919.

Lieut. Col. William F. Wesselhoeft, M. C., February 2, 1919, to May 2, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. William F. Wesselhoeft, M. C.

CHIEF OF MEDICAL SERVICE

Maj. John H. Rockwell, M. C.

BASE HOSPITAL NO. 45

Base Hospital No. 45 was organized in July, 1917, at the Medical College of Virginia, Richmond, Va., and was mobilized in March, 1918, at Camp Lee, Va., where it was trained and equipped. The organization remained at Camp Lee until July, 1918, and then proceeded to Newport News, Va., whence it sailed, July 10, 1918, on the *Aeolus*, reaching Brest, France, July 21. On July 30 the command relieved Camp Hospital No. 47, at Autun, Department of Saone et Loire, where it took over the Caserne Billard, which was an old monastery that required much renovation. On August 19, this hospital site was abandoned and the unit transferred to Toul, Department of Meurthe-et-Moselle, in the advance section, where it became part of the Justice hospital center. At Toul Base Hospital No. 45 relieved Evacuation Hospital No. 14 and Field Hospital 355, taking over the Caserne La Marche and a contagious annex half a mile distant. These buildings were four stories high, without plumbing or lights, and required extensive overhauling.

On account of its advanced position Base Hospital No. 45 for many weeks functioned as an evacuation hospital; during the St. Mihiel operation the hospital received sick and wounded direct from the battle field. The bed capacity of the hospital was 2,300. During its period of activity, August 19, 1918, to January 29, 1919, the hospital treated 17,438 sick and wounded; of these, 5,241 were surgical, 1,379 gassed, and 10,818 medical cases.

On January 29, 1919, Base Hospital No. 82 relieved Base Hospital No. 45; the latter organization returned to the United States by way of St. Nazaire on the *Walter A. Luckenbach*, April 9, 1919. It arrived in the United States April 19, 1919, and was demobilized at Camp Lee, Va., shortly afterwards.

* The statements of fact appearing herein are based on the "History, Base Hospital No. 45, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Alexander Williams, M. C., March 30, 1918, to August 10, 1918.

Lieut. Col. Stuart McGuire, M. C., August 11, 1918, to January 21, 1919.

Maj. John G. Nelson, M. C., January 22, 1919, to demobilization.

CHIEF OF SURGICAL SERVICE

Maj. William L. Peple, M. C.

CHIEF OF MEDICAL SERVICE

Maj. John G. Nelson, M. C.,

BASE HOSPITAL NO. 46 *

Base Hospital No. 46 was organized in May, 1917, at the Medical Department of the University of Oregon, Portland, Oreg., and was mobilized, March 20, 1918, at Portland. On April 5, 1918, the unit was transferred to camp Lewis, Wash., for training and equipping. It remained at Camp Lewis until May 31, 1918, when it left for Camp Merritt, N. J., arriving there June 5. On June 11, it sailed from New York for Liverpool on the *Missenabia*; arrived there on June 25; Southampton was reached on the 26th; the English Channel crossed, June 27; Cherbourg, France, was reached on June 28. On the following day the organization entrained for its final destination Bazoilles-sur-Meuse, Department of Vosges, in the advance section, and arrived there on July 2, 1918. This was the fourth hospital to arrive at Bazoilles-sur-Meuse, where it formed a part of the large hospital center there. It occupied a set of type A wooden barracks, which were not quite completed at the time of occupancy, and 72 sections of marquee tents. The capacity of the hospital was 1,000 beds in barracks and 1,000 in tents, making a total bed capacity of 2,000; this was later increased to 2,300. Patients were first received on July 23, 1918. The largest number of patients in hospital was on October 19, 1918, when 1,544 were under treatment.

Base Hospital No. 46 was designated by the commanding officer of the hospital center as a special hospital for neurosurgical cases. The operating room, on account of nonarrival of equipment, did not begin to function until a month after the opening of the hospital. The total number of patients treated in hospital was 8,366; 3,422 were surgical cases, with 620 operations, and 4,944 medical cases.

On January 19, 1919, all remaining patients were evacuated, and Base Hospital No. 46 ceased to function. The unit proceeded to St. Nazaire and sailed from that port, on the *Finland*, for Newport News, Va., on April 20, 1919, and arrived May 1, 1919. On May 15 the organization left for Camp Lewis, Wash., and was demobilized on May 21, 1919.

* The statements of fact appearing herein are based on the "History, Base Hospital No. 46, A. E. F., by Lieut. Col. Robert C. Yenney, M. C., while on duty as a member of the staff of that hospital." The history is on file in the Historical Division, S. G. O. Washington, D. C.—Ed.

PERSONNEL

COMMANDING OFFICER

Col. W. R. Davis, M. C., April 1, 1918, to July 31, 1918.

Lieut. Col. C. A. Betts, M. C., August 1, 1918, to August 31, 1918.

Maj. Thomas M. Joyce, M. C., September 1, 1919, to October 1, 1918.

Lieut. Col. Robert C. Yenney, M. C., October, 2, 1918, to May 21, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Thomas M. Joyce, M. C.

Maj. William H. Skene, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Robert C. Yenney, M. C.

Maj. William S. Knox, M. C.

Maj. Otis B. Wight, M. C.

BASE HOSPITAL NO. 47¹

Base Hospital No. 47 was organized in June, 1917, at the San Francisco Hospital, San Francisco, Calif., and was mobilized at Camp Fremont, Calif., December 5, 1917. After three months of training at Camp Fremont, the unit on March 2 was ordered to Camp Greenleaf, Ga., for further training, and remained at the latter camp until June 1, 1918. From there the command proceeded to Camp Crane, Allentown, Pa., where another month was spent in drilling and preparation for oversea service. On July 5, the organization left for Hoboken, N. J., where, immediately upon arrival, it embarked on the *Leriatan*, leaving the following day, July 8, for Europe. It arrived at Brest, France, July 15, remained there in the rest camp for 12 days; entrained July 27, proceeded to its final destination, Beaune, Department Côte d'Or, in the advance section, and arrived there on July 31. It was the first medical organization to arrive at Beaune, where it later formed a part of the hospital center there. The unit occupied a set of type A barracks, which were incomplete at the time of occupancy. The buildings were rapidly completed and furnished with such equipment as was available, and the hospital was ready to receive patients by September 1, 1918. The first convoy of patients arrived September 15. The normal bed capacity of hospital was 1,000, with a crisis expansion of 1,000 in marquee tents.

On January 23, 1919, Evacuation Hospital No. 22 relieved Base Hospital No. 47. The latter organization sailed from St. Nazaire April 13, 1919, on the *Rijndam*, arrived at Newport News, Va., April 25, 1919, and left for the Presidio of San Francisco, Calif., April 28, 1919, where it demobilized May 10, 1919.

PERSONNEL

COMMANDING OFFICER

Col. C. J. Manly, M. C., December 5, 1917, to August 12, 1918.

Col. Charles G. Levison, M. C., August 13, 1918, to May 10, 1919.

¹ The statements of fact appearing herein are based on the "History, Base Hospital No. 47, A. E. F., by Capt. Joseph Felsen, M. C., while on duty as a member of the staff of that hospital." The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

CHIEF OF SURGICAL SERVICE

Capt. S. A. Bunnell, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Harold Sidebotham, M. C.

BASE HOSPITAL NO. 48 "

Base Hospital No. 48 was organized in November, 1917, at the Metropolitan Hospital, New York City, N. Y. The unit was mobilized in New York City, March 6, 1918, and proceeded the same day to General Hospital No. 2, Fort McHenry, Md., where it was trained and equipped until June 20, when it was transferred to Camp Mills, N. Y. On July 4, the organization boarded the *Aquitania* at New York, and the following day sailed for Liverpool, England, arriving there July 12, 1918. It proceeded immediately by rail to Southampton, arrived July 13, crossed the English Channel the same night, reaching Le Havre, France, July 14. It entrained the following day for Roanne, Department of Loire Inferieure; however, after a stay there of a few days, the unit was ordered, July 24, to proceed to the Mars hospital center for duty. Arriving at Mars-sur-Allier, Department of Nièvre, in the intermediate section, July 25, it began to function as a part of that hospital center.

This hospital was the second medical organization to arrive at Mars. It occupied a set of type A barracks there, which were nearly completed when taken over. The normal capacity of the hospital was 1,240 beds. The first convoy of patients arrived August 2, 1918; the total number of sick and wounded treated during the active service of the hospital was 4,822, of whom 2,960 were surgical cases, with 332 operations, and 1,862 medical cases.

On January 15, 1919, Evacuation Hospital No. 37 relieved Base Hospital No. 48, the latter organization leaving for Clisson, Department Loire Inferieure, February 14, where it rested for two months, awaiting transportation to the United States. It proceeded April 10, to St. Nazaire, leaving that port April 13, on the *Freedom*, and arrived in New York City, on April 28, 1919. The entire organization was demobilized at Camp Upton, N. Y., by May 10, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. William D. Herbert, M. C., April 2, 1918, to February 1, 1919.
Lieut. Col. W. F. Honan, M. C., February 2, 1919, to May 10, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. W. F. Honan, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Frederick M. Dearborn, M. C.

" The statements of fact appearing herein are based on the "History, Base Hospital No. 48, A. E. F.," by Lieut. Col. Frederick M. Dearborn, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

BASE HOSPITAL NO. 49 *

Base Hospital No. 49 was organized in September, 1917, at the Nebraska University, Omaha, Nebr. The unit was mobilized in Omaha, Nebr., on March 25, 1918, and was transferred to Fort Des Moines, Iowa, where it trained until July 4, 1918. It then proceeded to Camp Mills, N. Y., and sailed July 14, 1918, for Liverpool, England, on the *Karmalia*, arriving there July 31. Thence it traveled by rail to Southampton and, crossing the channel, arrived at Cherbourg, France, August 3, 1918. It entrained for Allerey, Department of Saone et Loire, in the intermediate section, and arrived there August 5, being the third medical organization to arrive at that center. At Allerey the unit occupied a section of type A wooden barracks, which were found very incomplete, but by August 23 the hospital was ready for patients, and on August 26 received its first convoy of sick and wounded.

The normal bed capacity of the hospital was 1,000, with an emergency expansion of 1,000. The largest number of patients in hospital under treatment was on November 10, 1918, when 1,950 were being cared for.

Base Hospital No. 49 was designated by the commanding officer of the center as a special hospital for mental and nervous disorders. During its period of activity, August 26, 1918, to January 20, 1919, the hospital cared for 2,562 surgical cases (with 506 operations), 1,902 medical, and 430 gassed cases.

Base Hospital No. 49 ceased to function on January 20, 1919, and the organization sailed from Brest on the *Manchuria*, April 12, 1919, arriving in New York April 23, 1919. The unit was transferred May 4, to Camp Dodge, Iowa, where it was demobilized May 7, 1919.

PERSONNEL**COMMANDING OFFICER**

Lieut. Col. Leopold Mitchell, M. C., March 30, 1918, to March 15, 1919.
Maj. Chas. A. Hull, M. C., March 16, 1919, to May 7, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Arthur C. Stokes, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Edson L. Bridges, M. C.

BASE HOSPITAL NO. 50 "

Base Hospital No. 50 was organized in October, 1917, at the University of Washington, Seattle, Wash., and was mobilized on March 27, 1918, at Fort Lawton, Wash. On April 6 the organization was transferred to Camp Fremont, Calif., where it received three months of training at the camp base hospital. At the expiration of this time the unit left Camp Fremont for Camp

* The statements of fact appearing herein are based on the "History, Base Hospital No. 49, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

" The statements of fact appearing herein are based on the "History, Base Hospital No. 50, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

Merritt, N. J., arriving at the latter station on July 10. It boarded the *Karmatia* on July 13, and sailed from New York on the following day; arrived in Liverpool, England, July 31, 1918, leaving next day by rail for Southampton; crossed the English Channel on the night of August 2, arriving at Cherbourg, France, August 3; entrained the following day for Mesves, Department of Nièvre, in the intermediate section, and arrived August 6. It was the third organization to arrive at Mesves, where it functioned as a part of one of our largest and important hospital centers. The unit occupied a set of type A wooden barracks, many of which were found to be in a state of incompleteness upon arrival. The first consignment of patients arrived on August 15.

This hospital received both surgical and medical cases and was a special hospital for compound fractures and joint injuries. The total number of sick and wounded treated was 7,399, with 1,135 operations. The normal bed capacity of the hospital was 1,000, with crisis expansion to 1,950.

All remaining patients on January 20, 1919, were transferred to Base Hospital No. 54, and Base Hospital No. 50 ceased to function on that date. The organization sailed from Brest on the *Graf Waldersee*, April 7, 1919, arrived in New York April 20, 1919, and was demobilized at Camp Lewis, Wash., May 5, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Ray W. Bryan, M. C., April 8, 1918, to January, 1919.

Lieut. Col. Eugene H. Allen, M. C., January, 1919, to May 5, 1919.

CHIEF OF SURGICAL SERVICE

Maj. James B. Eagleson, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Edward P. Fick, M. C.

BASE HOSPITAL NO. 51 *

Base Hospital No. 51 was organized on February 18, 1918, at Camp Greenleaf, Ga. The first personnel were assigned to the hospital on April 10, 1918, when 200 recruits were sent from the recruit section, Camp Greenleaf, to the base hospital at Camp Wheeler, Ga., for a course of training. At Camp Wheeler the unit received its full quota of officers and enlisted men, and remained there in training until July 29, 1918. On July 31 the organization arrived at Camp Upton, N. Y.; boarded the *Olympic* August 8; sailed from New York Harbor the following day; arrived at Southampton, England, August 17; crossed the English Channel on the night of August 18; arrived at Cherbourg August 19. After spending three days in the rest camp at Cherbourg, the organization proceeded by rail to Rimaucourt, Department Haute Marne, in the advance section, where it was to have functioned as a part of the hospital center there. Arriving at Rimaucourt on August 24

* The statements of fact appearing herein are based on the "History, Base Hospital No. 51, A. E. F.," by Second Lieut. Charles H. Ross, Sanitary Corps, while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

on the following day it was ordered to proceed to Toul, Department of Meurthe et Moselle, in the advance section, for duty. It entrained for Toul August 27, and arrived there on the same day.

It was the second base hospital to arrive at that station and functioned as a part of the Justice Hospital Center.

At Toul the organization was established in the "Caserne Febvier" which consisted of three large four-story buildings, two administration buildings, numerous storehouses, quarters and laundries. Although handicapped by the nonarrival of equipment and nurses, the hospital began to receive patients on September 5, 1918, a week after its arrival. Due to the advanced position, the hospital functioned during the early days of activities as an evacuation hospital, receiving patients by ambulance, direct from the front. The normal bed capacity of the hospital was 2,000. The total number of sick and wounded treated was 12,505. Of these 8,670 were medical, 3,231 surgical, 308 gassed, and 296 neurological cases.

Base Hospital No. 51 ceased to function on March 31, 1919, and the personnel sailed from Marseille May 15, 1919, on the *Canada*; arrived in the United States June 2, 1919, and the entire organization was demobilized at Camp Dix, N. J., by June 12, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Frederick A. Tucker, M. C., May 10, 1918, to January 22, 1919.

Lieut. Col. Daniel M. Hoyt, M. C., January 23, 1919, to February 17, 1919.

Maj. Charles H. Wilson, M. C., February 18, 1919, to March 26, 1919.

Maj. John C. Howard, M. C., March 27, 1919, to June 12, 1919.

CHIEF OF SURGICAL SERVICE

Maj. John C. Howard, M. C.

Lieut. Col. Homer B. Smith, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Daniel M. Hoyt, M. C.

Maj. George W. Miller, M. C.

Lieut. Col. Harry W. Goodall, M. C.

Lieut. Col. John G. Nelson, M. C.

Capt. Richard S. Eustis, M. C.

BASE HOSPITAL NO. 52 ^v

Base Hospital No. 52 was organized at Camp Greenleaf, Ga., from recruits of the recruit training battalion, at that station. The command was transferred April 11, 1918, to Camp Gordon, Ga., and there trained at the camp base hospital. It left Camp Gordon, July 5, arriving at Camp Merritt, N. J., July 7; embarked July 13 on the *Karmalia*, leaving New York harbor the follow-

^v The statements of fact appearing herein are based on the "History, Base Hospital No. 52, A. E. F.," by Col. David Baker, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division S. G. O., Washington, D. C.—Ed.

ing day, July 14, reaching Liverpool, England, July 31. On August 1, the unit proceeded by rail to Southampton; crossed the channel the following day, arriving at Cherbourg, France, August 3; entrained, August 5, for Rimaucourt, Department of Haute Marne, in the advance section, and arrived on August 8, 1918. It was the first medical organization to arrive at that station, and later functioned as a part of the Rimaucourt hospital center. The hospital was located in a section of type A unit, of 1,000 bed capacity, with additional 1,150 beds in marquee tents, making a total of 2,150 available beds. The first patient arrived September 14; the total number of sick and wounded treated was 6,388, of whom 3,327 were surgical and 2,128 medical cases.

Base Hospital No. 52 ceased to operate on January 22, 1919, and the unit sailed from St. Nazaire on the *Princess Matoika* on April 14, 1919; arrived at Newport News, Va., April 27, and was demobilized at Camp Sherman, Ohio, shortly afterward.

PERSONNEL

COMMANDING OFFICER

Col. David Baker, M. C., June 14, 1918, to March 20, 1919.

Maj. Arthur F. Weyerbacker, M. C., March 21, 1919, to demobilization.

CHIEF OF SURGICAL SERVICE

Maj. William F. Verdi, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Willard C. Stoner, M. C.

BASE HOSPITAL NO. 53 *

Base Hospital No. 53 was organized on April 10, 1918, at Camp Greenleaf, Ga., from drafted enlisted personnel. On April 11, the entire command was transferred to Camp Hancock, Ga., where it was trained at the camp base hospital. On July 8, the unit left Camp Hancock for Camp Merritt, N. J., arriving on July 10; left New York harbor on the *Karmalia*, July 14, and reached Liverpool, England, July 31. It entrained the following day for Southampton; crossed the English Channel on the night of August 3; arrived at Cherbourg, France, August 4; entrained the following day for Langres, Department of Haute Marne, in the advance section; arrived August 7, 1918. It was the first hospital unit to arrive at Langres, where later it formed a part of that hospital center. The hospital occupied a section of type A wooden barracks, and began receiving patients on September 16, 1918. It received both medical and surgical cases; a total of 12,108 sick and wounded were treated during its period of activity, September 16, 1918, to March 16, 1919. The normal bed capacity in barracks was 1,000; 500 additional beds were in marquee tents.

Base Hospital No. 53 ceased to function May 31, 1919, and the unit proceeded to St. Nazaire, sailing thence, June 16, 1919, on the *Julia Luckenbach*. It arrived in New York, June 28, 1919, and was demobilized at Camp Sherman, Ohio, July 5, 1919.

* The statements of fact appearing herein are based on the "History, Base Hospital No. 53, A. E. F.," by Col. W. Lee Hart, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

PERSONNEL

COMMANDING OFFICER

Maj. Richard P. Bell, M. C., April 18, 1918, to May 8, 1918.

Lieut. Col. Daniel A. Sinclair, M. C., May 9, 1918, to November 5, 1918.

Col. W. Lee Hart, M. C., November 6, 1918, to July 5, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Albert Halstead, M. C.

Capt. Joseph W. Hooper, M. C.

CHIEF OF MEDICAL SERVICE

Maj. M. S. Goodkind, M. C.

Capt. Frank P. Strome, M. C.

Maj. James M. Stoddard, M. C.

BASE HOSPITAL NO. 54 ^a

Base Hospital No. 54 was organized in May, 1918, at Camp Greene, N. C., from officers and enlisted men taken from the Army at large, and trained at the Camp Greene base hospital. August 7, 1918, the command was transferred to Newport News, Va.; left on the *Patricia*, August 14, 1918; arrived at Brest, France, August 25, 1918; remained at the rest camp until September 3, 1918, proceeded by rail to Mesves, Department of Nièvre, intermediate section; arrived September 6, 1918. This was the fourth hospital unit to arrive at Mesves, where it functioned as a part of that hospital center. The hospital occupied a set of type A wooden barracks, and a number of marquee tents for crisis expansion. The normal bed capacity in barracks was 1,000 beds, with emergency expansion to 2,000. The first patients were received on September 12, 1918, and the hospital functioned from that date until April 13, 1919. The largest number of patients in hospital was October 26, 1918, when 2,288 were under treatment. On January 20, 1919, it took over patients and property of Base Hospital No. 50, the latter organization being relieved from further service.

The organization left St. Nazaire on the *Dakotan*, May 16, 1919; arrived in Philadelphia, May 28, 1919, and was demobilized at Camp Grant, Ill., May 30, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. William S. Sheep, M. C., May 2, 1918, to July 15, 1918.

Col. Henry Page, M. C., July 16, 1918, to September 6, 1918.

Lieut. Col. Jonathan M. Wainwright, M. C., September 7, 1918, to March, 1919.

Lieut. Col. Thomas J. Burrage, M. C., March, 1919, to May 30, 1919.

^a The statements of fact appearing herein are based on the "History, Base Hospital No. 54, A. E. F., by Lieut. Col. Jonathan M. Wainwright, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Jonathan M. Wainwright, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Thomas J. Burrage, M. C.

BASE HOSPITAL NO. 55 ^b

Base Hospital No. 55 was organized in June, 1918, at Camp Greenleaf, Ga., the enlisted personnel being assigned from the recruit section of that camp. The unit trained until August 22, 1918, when it proceeded to Camp Merritt, N. J.; arrived on August 24; embarked on the *Plattsburg*, August 29; sailed the following day, August 30, for France; arrived at Brest, France, September 12; remained in the rest camp until September 19; entrained for Mesves-sur-Loire, Department of Nièvre; arrived September 23. Two days later, September 25, the unit was ordered to proceed to Toul, Department of Meurthe-et-Moselle, in the advance section, where it functioned as a part of the hospital center there. It arrived at Toul on September 25, and was the fifth medical organization to reach that station. It occupied the Caserne Thouvenat Annex, consisting of several one-story concrete barracks, located about a mile from the other hospitals of the center. In addition to the barracks, a number of marquee tents had been erected, bringing the normal capacity of the hospital up to 1,600 beds. The total number of sick and wounded treated during the period of activity of the hospital, October 1, 1918, to March 31, 1919, was 4,459; of these, 161 were surgical, 3,815 medical, and 483 gassed cases.

Base Hospital No. 55 ceased to function on March 31, 1919. The unit sailed from Marseille on the *Canada*, May 15, 1919, arrived in New York, June 2, 1919, and was demobilized at Camp Pike, Ark., June 11, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Damon B. Pfeiffer, M. C., August 18, 1918, to February 3, 1919.

Lieut. Col. Franklin B. Balch, M. C., February 4, 1919, to February 18, 1919.

Lieut. Col. Daniel M. Hoyt, M. C., February 19, 1919, to June 11, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Franklin B. Balch, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Daniel M. Hoyt, M. C.

Capt. Burton Hamilton, M. C.

^b The statements of fact appearing herein are based on the "History, Base Hospital No. 55, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington D. C.—Ed.

BASE HOSPITAL NO. 56^c

Base Hospital No. 56 was organized June 13, 1918, at Camp Greenleaf, Ga., from enlisted personnel of the recruit section of that camp. After several weeks of drilling the unit was transferred to the base hospital at Camp Wadsworth, S. C., for further training. On August 22 the organization entrained for Camp Merritt, N. J.; arrived August 23; sailed from Hoboken, N. J., August 30, on the *Kroonland*, reached Brest, France, September 12, 1918; remained five days in the rest camp at Brest, France, and on September 18, 1918, entrained for Allerey, Department of Saone et Loire, in the intermediate section, its permanent station.

It arrived at Allerey on September 20 and was the fourth hospital to reach that station. Upon arrival the unit immediately began to function as a part of the Allerey hospital center, where it occupied a section of type A wooden barracks, which at that time were being operated by a subunit from Base Hospital No. 49, and had about 400 cases under treatment. The bed capacity of the hospital was 1,800, in barracks and tents. This hospital received both surgical and medical cases, and in addition received all genitourinary and contagious disease cases in the center. The total number of patients treated was 7,766.

Base Hospital No. 56 ceased to function February 1, 1919, and the personnel sailed from St. Nazaire for Newport News, Va., April 19, 1919, on the *Mercury*; arrived April 30, 1919, and was demobilized at Camp Dix, N. J., May 3, 1919.

PERSONNEL**COMMANDING OFFICER**

Lieut. Col. George M. Coates, M. C., July 25, 1918, to October 14, 1918.

Lieut. Col. Leopold Mitchell, M. C., October 15, 1918, to November 17, 1918.

Col. Charles W. Decker, M. C., November 18, 1918, to May 3, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Thomas C. Witherspoon, M. C.

CHIEF OF MEDICAL SERVICE

Maj. James D. Pilcher, M. C.

BASE HOSPITAL NO. 57^d

Base Hospital No. 57 was organized April 2, 1918, at Camp Greenleaf, Ga., from enlisted men of the recruit section of that camp; a majority of these men were from a draft from Oil City, Pa. At Camp Greenleaf, the organization was trained until July 21, when it proceeded to Camp Merritt, N. J., arriving there on July 23. On July 31, the unit embarked on the *Madingo*;

^c The statements of fact appearing herein are based on the "History, Base Hospital No. 56, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^d The statements of fact appearing herein are based on the "History, Base Hospital No. 57, A. E. F.," by Col. Edward C. Mitchell, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

sailed on August 1, for Liverpool, England; arrived August 15, and the following morning entrained for Southampton, where it spent three days in the rest camp. On August 20 it embarked on the *Londonderry* and crossed the English Channel; reached Le Havre, France, August 21; left Le Havre, August 23, for Juilly, Department Seine et Marne; arrived on the same date. There, the unit took over the hospital operated by Evacuation Hospital No. 8, which had about 250 patients, mostly French battle casualties. The unit remained at Juilly until September 16, 1918, when it was ordered to Paris to establish a 1,000-bed hospital.



FIG. 141.—Base Hospital No. 57, Paris

In Paris, Base Hospital No. 57 took over a large school building and functioned there as a part of the Paris district. There the normal bed capacity of the hospital was 1,800, distributed in 75 wards; but during October, 1918, as many as 2,000 sick and wounded were in the hospital. This hospital admitted both surgical and medical cases; the total number admitted was 8,505. The hospital also operated a central dental infirmary, which cared for a majority of the dental cases in the district of Paris; 7,292 such patients received treatment during its period of activity.

It sailed from Brest, France, August 13, 1919, and arrived in the United States August 22, 1919, aboard the *Kaiserine Augusta Victoria*, and was demobilized shortly afterwards.

PERSONNEL

COMMANDING OFFICER

Col. Edward C. Mitchell, M. C., April 2, 1918, to August 22, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Frank D. Smythe, M. C.

Maj. David M. Henning, M. C.

Lieut. Col. Junius Lynch, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Theodore L. Boutillier, M. C.

BASE HOSPITAL NO. 58 *

Base Hospital No. 58 was organized on June 3, 1918, at Camp Grant, Ill., from recruits of the Army at large. The unit was trained at that camp until August 16, 1918, when it left for Camp Upton, N. Y.; arrived, August 18; sailed for France, August 23, on the *Chicago*, and arrived at Bordeaux, France, September 5, 1918. It remained in the rest camp there until September 8, when it entrained for Rimaucourt, Department Haute Marne, in the advance section, and arrived September 12, 1918. It was the second hospital to arrive at Rimaucourt, where it functioned as a part of that hospital center. It occupied a section of type A wooden barracks, of 1,000-bed capacity; and 1,000 beds were available in marquée tents. It was designated as a special hospital for respiratory infectious diseases only. It had every bed cubicled, and no one was allowed to enter the wards of this hospital unmasked. The first patients were received September 20, 1918; during its activity the hospital admitted 4,588 cases.

The hospital ceased to function on January 25, 1919, and the unit sailed from St. Nazaire April 14, 1919, on the *Matoika*; arrived at Newport News, Va., April 27, 1919, and was demobilized at Camp Dix, N. J., May 5, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. William H. Walsh, M. C., June 3, 1918, to November 1, 1918.

Col. David A. Baker, M. C., November 2, 1918, to November 26, 1918.

Lieut. Col. John W. Barksdale, M. C., November 27, 1918, to May 5, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. John W. Barksdale, M. C.

Maj. Clarence B. Ingraham, M. C.

CHIEF OF MEDICAL SERVICE

Maj. David H. Haller, M. C.

Capt. Guy D. Griggs, M. C.

* The statements of fact appearing herein are based on the "History, Base Hospital No. 58, A. E. F.," by Lieut. Col. John W. Barksdale, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

BASE HOSPITAL NO. 59^f

Base Hospital No. 59 was organized in April, 1918, at Camp Greenleaf, Ga., from enlisted men of the recruit section of that camp and officers from the Medical Reserve Corps at large. The unit was transferred to the base hospital at Camp Shelby, Miss., for training. It left Camp Shelby August 28, arriving at Camp Stewart, Newport News, Va., August 31; embarked on September 6 on the *Madawaska*; sailed from Norfolk, Va., September 8; arrived at Brest, France, September 21, 1918; remained in the rest camp until September 29; left by rail for its final destination, Rimaucourt, Department of Haute Marne, in the advance section; arrived October 1. It was the fourth hospital to reach that station, where it functioned as a part of the Rimaucourt hospital center. It occupied a section of type A wooden barracks of 1,000-bed capacity, with an additional 1,000 beds in marquée tents. This hospital received only medical and gas cases. The first patients arrived October 8, 1918; the largest number of patients in hospital at one time was in October, 1918, when 1,660 were being cared for.

Base Hospital No. 59 ceased to function May 31, 1919, and the unit sailed from Marseille June 12, 1919, on the *Taormina*; arrived in the United States June 27, 1919, and was demobilized at Camp Dix, N. J., July 13, 1919.

PERSONNEL**COMMANDING OFFICER**

Lieut. Col. Irvin Abell, M. C., April 16, 1918, to April 16, 1919.

Maj. Llewellyn P. Spears, M. C., April 17, 1919, to July 13, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Benjamin F. Zimmerman, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Sidney J. Meyers, M. C.

Maj. Llewellyn P. Spears, M. C.

BASE HOSPITAL NO. 60^o

Base Hospital No. 60 was organized in April, 1918, at Camp Greenleaf, Ga., from enlisted men of the recruit section at that camp and officers from the Army at large. The unit was transferred April 14, 1918, to the base hospital at Camp Jackson, S. C., for training. August 11 the unit proceeded to Newport News, Va.; arrived the following day; remained at Camp Stewart, Va., until August 22; left on that date for Europe on the *Dante Aleghiers*; arrived at Brest, France, September 3; remained in the rest camp until September 11; departed for its permanent station in the hospital center at Bazoilles-sur-Meuse, Department of the Vosges, advance section; arrived September 15. It was

^f The statements of fact appearing herein are based on the "History, Base Hospital No. 59, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^o The statements of fact appearing herein are based on the "History, Base Hospital No. 60, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

the fifth unit to reach that station and occupied a section of type A wooden barracks of 1,000-bed capacity, with additional 1,000 beds in marquee tents.

The hospital opened for patients October 5, and during its period of activity treated 3,684 medical and 2,304 surgical cases, with 334 operations. On March 31, 1919, all remaining patients were transferred to other hospitals in the center, and Base Hospital No. 60 ceased to function on that date. The unit sailed from St. Nazaire June 15, 1919, on the *Texan*; arrived in United States June 29, and was demobilized at Camp Sherman, Ohio, July 2, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. H. L. Dale, M. C., May 26, 1918, to April 23, 1919.

Maj. J. M. Hutcheson, M. C., April 24, 1919, to July 2, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. E. P. Quain, M. C.

Maj. Martin A. Reddan, M. C.

Capt. Harold K. Bell, M. C.

CHIEF OF MEDICAL SERVICE

Maj. James M. Hutcheson, M. C.

BASE HOSPITAL NO. 61 ^a

Base Hospital No. 61 was organized June 5, 1918, at Camp Greenleaf, Ga., from recruits of the Army at large, and was transferred, June 30, to the Base hospital at Camp Lee, Va., remaining there in training until August 21, when it was ordered to Newport News, Va., for embarkation. It arrived on August 22; embarked and sailed on the same day, on the *Lutetia*, for Brest, France; arrived September 3; rested at Brest for a week, and then proceeded to its final destination, Beaune, Department Côte d'Or, in the advance section; arrived September 13. It was the second hospital unit to arrive at Beaune, where it formed a part of the Beaune hospital center. The unit occupied a section of type A wooden barracks of 1,000-bed capacity, with additional 600 beds in marquee tents.

The first convoy of patients was received October 5, 1918. The largest number of patients in hospital was on October 31, when 1,490 were being treated. During its period of activity, October 5, 1918, to January 31, 1919, the hospital admitted 1,183 medical and 1,626 surgical cases, with 555 operations. The dental department of the hospital performed all the dental work for the entire hospital center.

January 31, 1919, all remaining patients were transferred to other hospitals in the center, and Base Hospital No. 61 ceased to function as a hospital. The unit sailed from St. Nazaire April 9, 1919, on the *Luckenbach*, arrived in New York April 19, 1919, and was demobilized at Camp Dix, N. J., April 27, 1919.

^a The statements of fact appearing herein are based on the "History, Base Hospital No. 61, A. E. F.," by Maj. Royale H. Fowler, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Charles S. Lawrence, M. C., June 5, 1918, to April 27, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Charles A. Stevens, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Bernard S. Oppenheimer, M. C.

BASE HOSPITAL NO. 62¹

Base Hospital No. 62 was organized in June, 1918, at Camp Greenleaf, Ga., from recruits of the Army at large. On June 29, the organization was transferred to Camp Upton, Long Island, N. Y., for further training at the base hospital of that camp. The unit left Camp Upton, August 29, for the port of embarkation, Hoboken, N. J., where it boarded the *Northern Pacific*, for Brest, France; arrived September 7; disembarked the following day and remained for eight days in the rest camp at Pontanezen Barracks awaiting orders; entrained at Brest, September 16, for its final destination, Mars-sur-Alliers, Department of Nièvre, in the intermediate section; arrived September 19, 1918. It was the fifth medical organization to arrive at Mars, where it formed a part of the large hospital center there. The hospital occupied a section of type A wooden barracks, with normal capacity of 1,000 beds, and began to receive patients on October 5; 791 were admitted on that date.

During its period of activity, October 5, 1918, to February 15, 1919, the organization cared for 3,631 sick and wounded; of these, 3,232 were medical and 399 surgical cases.

On February 15, 1919, Base Hospital No. 62 ceased to function as a hospital. Subsequently the unit proceeded to St. Nazaire and sailed from that port May 17, 1919, on the *Antigone*, for Newport News, Va.; arrived May 29, and was demobilized at Camp Dix, N. J., June 7, 1919.

PERSONNEL

COMMANDING OFFICER

Capt. Rufus H. Fisher, M. C., June 13, 1918, to August 2, 1918.

Lieut. Col. Richard L. Cook, M. C., August 3, 1918, to June 7, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Herbert B. Perry, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. David Bovaird, M. C.

¹ The statements of fact appearing herein are based on the "History, Base Hospital No. 62, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

BASE HOSPITAL NO. 63ⁱ

Base Hospital No. 63 was organized in June, 1918, at Camp Greenleaf, Ga., from enlisted men of the recruit section of that camp, and was transferred June 30, to Camp McClellan, Ala., for further mobilization and training. The unit trained at the base hospital at Camp McClellan until August 19, when it proceeded to Camp Merritt, N. J., for embarkation; sailed from Hoboken, N. J., on the *Leviathan*, August 31; arrived at Brest, France, September 7; debarked the following day and marched to the rest camp at Pontanezen Barracks, where it remained awaiting orders; September 12 it proceeded to Caen, Department of Calvados, base section No. 4, and arrived September 13. It was the first American organization to arrive at Caen and was to function as an independent hospital. The unit took over a large stone building, and proceeded to convert it into a hospital. By the end of September, 1918, it was ready to receive patients, with a bed capacity of about 300, but no patients were ever sent there. In October and November, 1918, part of the unit was ordered on detached service in different hospitals, and the building in which the hospital operated was ordered abandoned. On December 15 the unit was ordered to proceed to Chateauroux, Department of Indre, where it relieved Base Hospital No. 9. It arrived at Chateauroux January 3, 1919, and assumed operation of the hospital on January 14, 1919.

On March 21, 1919, Base Hospital No. 63 ceased to function as a hospital and all of the personnel, with the exception of the commanding officer, 1 non-commissioned officer, and 3 privates, were transferred to Camp Hospital No. 109 for duty. The skeletonized unit sailed from Brest April 16, 1919, and arrived at Hoboken, N. J., April 25, 1919.

PERSONNEL**COMMANDING OFFICER**

Col. Charles Willcox, M. C., June 1, 1918, to March 21, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Lucius E. Burch, M. C.

CHIEF OF MEDICAL SERVICE

Maj. William D. Alsever, M. C.

BASE HOSPITAL NO. 64^k

Base Hospital No. 64 was organized June 5, 1918, at Camp Greenleaf, Ga., from enlisted men of the recruit section at that camp. The unit was transferred June 28, to Camp Sevier, S. C., where it was trained at the camp base hospital. The organization left Camp Sevier August 19; proceeded to Camp Merritt, N. J.; arrived August 21; departed from port of embarkation Hoboken, N. J., on the *Belgic*, September 1; arrived at Liverpool, England,

ⁱ The statements of fact appearing herein are based on the "History, Base Hospital No. 63, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^k The statements of fact appearing herein are based on the "History, Base Hospital No. 64, A. E. F.," by Lieut. Col. Roy T. Morris, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

September 13; proceeded by rail to Southampton and crossed the English Channel on September 16; reached Cherbourg, France, September 17. It entrained the following day for its final destination, Rimaucourt, Department Haute Marne, in the advance section of the American Expeditionary Forces; arrived September 21. This was the third hospital unit to arrive at Rimaucourt, where it occupied a section of type A wooden barracks and functioned as a part of that hospital center. The normal capacity of that hospital was 1,000 beds in barracks, with additional 1,500 beds in marquee tents. This hospital was designated to receive all gas cases and infected surgical cases for the center. The number of patients admitted from October 4, 1918, to January 28, 1919, was 3,395.

The hospital ceased to function on April 21, 1919, and the unit was transferred to Brest, France, for return to the United States; sailed June 9, 1919, on the *Vermont* for Newport News, Va.; arrived June 20, 1919, and the entire organization was demobilized at Camp Dix, N. J., June 25, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Roy T. Morris, M. C., June 5, 1918, to June 25, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. William B. Reid, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Joseph H. Cattons, M. C.

Maj. Charles O. Moore, M. C.

BASE HOSPITAL NO. 65¹

Base Hospital No. 65 was organized in March, 1918, at Fort McPherson, Ga., from enlisted men of the Army at large; the majority of these men were from the State of North Carolina. The organization was trained at Fort McPherson, and received special instructions at General Hospital No. 6 there. On August 9 the unit was ordered to Camp Upton, N. Y., where it arrived the following day; left August 29 for Hoboken, N. J.; sailed August 30 on the *Kroonland*; arrived at Brest, France, September 12; remained in the rest camp at Brest until September 16, when it was ordered to proceed to the Kerhuon hospital center near by for duty.

The hospital ceased to function July 15, 1919, and the unit sailed from Brest for New York July 30, 1919, on the *Leviathan*; arrived August 6, 1919, and was demobilized at Camp Lee, Va., August 13, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Frederick M. Hanes, M. C., March, 1918, to July 26, 1918.

Lieut. Col. W. E. Butler, M. C., July 27, 1918, to October 31, 1918.

Lieut. Col. Frederick M. Hanes, M. C., November 1, 1918, to April 12, 1919.

Lieut. Col. J. B. Anderson, M. C., April 13, 1918, to June 26, 1919.

Lieut. Col. Leopold Mitchell, M. C., June 27, 1919, to July 15, 1919.

¹ The statements of fact appearing herein are based on the "History, Base Hospital No. 65, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

CHIEF OF SURGICAL SERVICE

Lieut. Col. John W. Long, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Frederick M. Hanes, M. C.

BASE HOSPITAL NO. 66 ^m

Base Hospital No. 66 was organized November 6, 1917, at Camp Merritt, N. J., from officers and enlisted men of the Army at large. It was the first base hospital organized from the Regular Army and was designated as a genitourinary hospital; its commissioned personnel were selected with that point in view. The unit underwent extensive training at Camp Merritt, N. J., for a period of one month, and on December 17, 1917, embarked at New York on the *Orduna*; left port on the following day, December 18, for Halifax, Nova Scotia, where it remained for two days; sailed for Glasgow, Scotland; arrived December 31, 1917. From Glasgow the organization proceeded to the rest camp at Winchester, England; remained until January 14, 1918; left for Southampton, England; crossed the English Channel on the night of January 14; landed at Le Havre, France, January 15. On the following day the unit proceeded by rail to its permanent station at Neufchateau, Department Vosges, advance section, and arrived January 18, 1918.

It took over a 500-bed hospital located at the Rebeval Barracks, just outside of Neufchateau, which at that time was being operated by Field Hospitals Nos. 101 and 104, of the 26th Division. These barracks were typical old French casernes, unsuitable for hospitalization. Base Hospital No. 66 assumed charge of the hospital, which contained about 500 patients, on January 19, 1918, and began operations under very trying circumstances.

Shortly after the arrival of the unit the hospital was brought up to an efficient status and its capacity increased from 500 to 2,600 beds. Base Hospital No. 66 operated independently of any hospital until August 11, 1918, when it was placed under the hospital center at Bazoilles; but on November 10, 1918, it was again made independent.

Up to June, 1918, very few battle casualties were received. Practically all of the patients admitted up to that time were from organizations stationed around Neufchateau. During the time the unit functioned as a part of the hospital center at Bazoilles it admitted 6,913 surgical and medical cases. Although this unit was organized as a special hospital for venereal and genitourinary work, it never functioned as such.

Base Hospital No. 66 ceased to operate on December 31, 1918, and returned to the United States, sailing from St. Nazaire on the *Princess Matoika* January 30, 1919. It arrived at Newport News, Va., February 11, 1919, and was demobilized at Camp Devens, Mass., shortly afterwards.

^m The statements of fact appearing herein are based on the "History, Base Hospital No. 66, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

PERSONNEL

COMMANDING OFFICER

Col. H. C. Maddux, M. C., November 6, 1917, to June 17, 1918.

Capt. Blase Cole, M. C., June 18, 1918, to October 13, 1918.

Maj. Robert B. Hill, M. C., October 14, 1918, to demobilization.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Macy Brooks, M. C.

CHIEF OF MEDICAL SERVICE

Maj. George B. Wallace, M. C.

BASE HOSPITAL NO. 67 ^a

Base Hospital No. 67 was organized in April, 1918, at Camp Crane, Allentown, Pa., from officers and enlisted men of the Army at large. This hospital was originally organized as a genitourinary unit, and its personnel were selected with that point in view. Later it was decided that such a unit was not required abroad, and some alterations in the organization were made. The unit was trained at Camp Crane, Pa., until July 5, when it proceeded to Hoboken, N. J.; sailed from that port on the *Leviathan*, July 8. It arrived at Brest, France, July 15, remained encamped near Pontanezen Barracks for two weeks. On July 29 the organization was ordered to Mesves, Department of Nièvre, in the intermediate section, where it arrived August 1, and immediately began to function as a part of the hospital center there. It was the first medical unit to arrive at Mesves, where it occupied a set of type A wooden barracks. The organization found 400 surgical cases in the wards of the hospital, who had been received just an hour prior to its arrival at Mesves. It immediately took hold of the work and in a few hours made itself ready for self-sustainment. On the following day, 600 additional wounded arrived; thus within 24 hours this hospital had a total of 1,075 patients, largely seriously wounded men from the Chateau-Thierry operation.

The first few days the hospital staff was greatly handicapped by the lack of adequate equipment to perform surgical work. The normal capacity of hospital was 1,000 beds in barracks, with an additional 1,000 in marquee tents. During the early part of October, 1918, as many as 2,370 patients were in the hospital; beds and cots were placed in warehouses, Red Cross huts, and every other available space. During its period of activity, August 1, 1918, to January 20, 1919, the hospital received 7,853 surgical and medical cases.

On January 20, 1919, Evacuation Hospital No. 24, took over patients of Base Hospital No. 67, the latter organization returning to the United States. Leaving St. Nazaire April 14, 1919, on the *Princess Matoika* for Newport News, Va., it arrived in United States April 27, 1919, and was demobilized at Camp Dix, N. J., and Camp Sherman, Ohio, by May 3, 1919.

^a The statements of fact appearing herein are based on the "History, Base Hospital No. 67, A. E. F.," by Lieut. Col. H. O. Reik, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. William Herschel Allen, M. C., April 26, 1918, to October 18, 1918.

Lieut. Col. Henry O. Reik, M. C., October 18, 1918, to February, 1919.

Maj. Thomas E. Chandler, M. C., February, 1919, to May 3, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. John A. Hawkins, M. C.

Maj. Jesse T. McDavid, M. C.

Maj. A. R. Stevens, M. C.

CHIEF OF MEDICAL SERVICE

Maj. H. Nall, M. C.

BASE HOSPITAL NO. 68 °

Base Hospital No. 68 was organized in April, 1918, at Camp Crane, Allentown, Pa., from officers and enlisted men of the Army at large. The organization underwent training at that camp until July 7, when the unit proceeded to the port of embarkation, Hoboken, N. J., arriving there and boarding the *Leviathan* the same day. It sailed from Hoboken the following day, July 8; arrived at Brest, France, July 15, 1919; marched to the rest camp at Pontanezen Barracks, where it remained until July 22; entrained at Brest for its final destination, Mars-sur-Allier, Department of Nièvre, in the intermediate section; arrived July 24. The unit occupied a set of type A wooden barracks, and began receiving patients on August 2. It was the first hospital unit to arrive at Mars, where it formed a part of the hospital center there.

The primary normal bed capacity of the hospital was 1,000; later, however, another section of barracks was taken over by the hospital and the capacity was increased to 3,500 beds, with an emergency expansion to 4,000. It received both surgical and medical cases; the number admitted from August 2, 1918, to November 20, 1918, was 7,021.

On January 20, 1919, Base Hospital No. 131 took over patients and property of Base Hospital No. 68, the latter organization then ceasing to function as a hospital. The unit proceeded to St. Nazaire, from which port it sailed April 14, 1919, on the *Princess Matoika* for Newport News, Va., arriving in the United States April 27, 1919. Upon arrival at Newport News, the unit was split up and sent to Camp Dix, N. J., and Camp Sherman, Ohio, for demobilization. The entire unit was demobilized by May 5, 1919.

PERSONNEL

COMMANDING OFFICER

Col. Roy C. Heflebower, M. C., April 17, 1918, to January 22, 1918.

Maj. Robert N. Severance, M. C., January 23, 1919, to May 5, 1919.

° The statements of fact appearing herein are based on the "History, Base Hospital No. 68, A. E. F.," by Col. Scott D. Breckinridge, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Elizah H. Sitar, M. C.

Lieut. Col. A. E. Halstead, M. C.

Maj. Robert N. Severance, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Walter H. Wood, M. C.

BASE HOSPITAL NO. 69 ^p

Base Hospital No. 69 was organized June 11, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large. The unit was transferred to Camp Meade, Md., June 30, for training. On August 26, the organization entrained for the port of embarkation, Hoboken, N. J.; embarked on the *Susquehanna*, sailing August 30, for overseas service; arrived at Brest, France, September 12; proceeded to the rest camp at Pontanezen Barracks; remained there awaiting orders until September 20, and entrained for its final destination, Savenay, Department Loire Inferieure, in the base section No. 5, where it arrived September 21. It was the second unit to arrive at that station and immediately began to function as a part of the Savenay hospital center. The organization was assigned to a hospital plant consisting of 68 buildings, of the knock-down wooden barrack type, of which 55 had been completed. The bed capacity was 2,500, and some of the wards were already filled with patients when the unit arrived.

While originally designated to receive venereal cases and, later, urological surgical cases, the demands had been such that the hospital cared for the average type of patient of the more serious class evacuated to that center. During its period of activity, September 21, 1918, to June 7, 1919, over 15,000 sick and wounded patients were admitted to the hospital.

On January 31, 1919, the unit took over Base Hospital No. 8, the latter organization being ordered to prepare for return to the United States at the same time. Base Hospital No. 88 took over the hospital plant and patients of Base Hospital No. 69.

On June 7, 1919, the hospital was formally closed, and the unit sailed from St. Nazaire July 6, 1919, on the *Scranton*; arrived in the United States July 16, 1919, and was demobilized at Camp Grant, Ill., July 21, 1919.

PERSONNEL

COMMANDING OFFICER

Col. Scott D. Breckinridge, M. C., July, 1918, to June 15, 1919.

Maj. Walter C. G. Kirchner, M. C., June 16, 1919, to July 21, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Jonathan E. Burns, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Oliver H. P. Pepper, M. C.

^p The statements of fact appearing herein are based on the "History, Base Hospital No. 69, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

BASE HOSPITAL NO. 70 ^a

Base Hospital No. 70 was organized May 29, 1918, at Fort Riley, Kans., from officers and enlisted men of the Army at large. The majority of the enlisted men were casualties from the Medical Officers' Training Camp at Fort Riley, and had been inducted into the service from the State of Oklahoma in May, 1918. June 17 the organization was transferred to Fort Ontario, N. Y., and was trained at General Hospital No. 5 there. The unit left Fort Ontario, September 2, for the port of embarkation, Hoboken, N. J.; arrived September 3; embarked on the *Siboney*, September 4; sailed on the same day for St. Nazaire, France; arrived at St. Nazaire, September 13; disembarked and marched to Rest Camp No. 1, where it remained one week awaiting orders; entrained September 19 for Allerey, Department of Saone et Loire, in the intermediate section, and reached that station on September 22. This was the fifth hospital unit to arrive at Allerey, where it functioned as a part of the hospital center. The unit occupied a section of wooden, type A barracks, and began to receive patients on October 4.

When organized this unit was designated as a venereal hospital, but on arrival in France it did not function as such but received both surgical and medical cases.

In October, 1918, a part of the personnel was detached and organized into a subsidiary unit, called 70A. The bed capacity of hospital was 1,500, with an emergency expansion to 2,200, while that of 70A was 1,700. The largest number of patients cared for at one time was 1,448, on November 11, in Base Hospital No. 70, and 1,432 on November 14, in 70A. The total number of patients treated was 5,371. On December 17 unit 70A was taken over by Base Hospital No. 97 and the personnel returned to Base Hospital No. 70.

Base Hospital No. 70 ceased to function on February 4, 1919, and the unit sailed from St. Nazaire, April 13, 1919, on the *Freedom*, arriving at New York, April 28, 1919. The entire unit was demobilized at Camp Pike, Ark., May 14, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. T. Victor Keen, M. C., July 18, 1918, to October 16, 1918.
Lieut. Col. Leopold Mitchell, M. C., October 17, 1918, to December 8, 1918.
Maj. Hugh S. Willson, M. C., December 9, 1918, to March, 1919.
Maj. Arthur D. West, M. C., March, 1919, to May 14, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Alexander Peacock, M. C.
Lieut. Col. Levi L. Reggin, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Hugh S. Willson, M. C.
Maj. John J. Cunningham, M. C.

^a The statements of fact appearing herein are based on the "History, Base Hospital No. 70, A. E. F.," by the commanding officer of the hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

BASE HOSPITAL NO. 71 *

Base Hospital No. 71 was organized July 13, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large. The organization was transferred, August 17, to Camp Beauregard, La., where it underwent training. On October 26, the unit was ordered to Camp Upton, Long Island, N. Y.; arrived October 29; remained until November 10; proceeded to New York and boarded the *Empress of Asia*; sailed, November 12, for France; arrived at Brest, France, November 22; encamped at Pontanezen Barracks, and remained there awaiting orders until November 29; proceeded by rail to Pau, Department Basses Pyrenees, base section No. 2, and arrived December 1, 1918. It was the first hospital unit to arrive at Pau, where it was to function as a part of what was to be a small hospital center. The organization took over from the French four hotels and one school building, and made preparations to convert them into a hospital. On December 30, before any patients were admitted to the center, hospitalization at Pau was abandoned and Base Hospital No. 71 was transferred, January 11, 1919, to Vauclaire, Department of Dordogne, base section No. 2, to relieve Base Hospital No. 3.

On January 20, the unit took over patients and property of Base Hospital No. 3, and immediately began to function as a hospital. There were about 400 patients in the hospital when the unit took charge, and during its two months of active service at Vauclaire, 167 patients were admitted.

Base Hospital No. 71 ceased to function on March 20, 1919; part of the unit was transferred to other stations for duty, and the remainder returned to the United States, sailing from Bordeaux, May 12, on the *Panaman*. It arrived in the United States May 23, 1919, and was demobilized at Camp Shelby, Miss., May 31, 1919.

PERSONNEL**COMMANDING OFFICER**

Maj. Henry Abraham, M. C., August 26, 1918, to September 28, 1919.
Col. Alexander C. Abbott, M. C., September 29, 1918, to January 26, 1919.
Maj. George W. Schwartz, M. C., January 27, 1919, to March 31, 1919.
First Lieut. John R. Ransom, M. C., April 1, 1919, to May 31, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Clarence Martin, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Henry Abraham, M. C.

BASE HOSPITAL NO. 72 *

Base Hospital No. 72 was organized August 15, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large. The organization was transferred to Camp Gorden, Ga., and there trained at the camp base hospital.

* The statements of fact appearing herein are based on the "History, Base Hospital No. 71, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

* The statements of fact appearing herein are based on the "History, base Hospital No. 72, A. E. F.," by Maj. Clarence M. Dollman, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

On October 19, the unit entrained for Camp Upton, Long Island, N. Y.; arrived October 21; on October 26, it proceeded to New York; embarked on the *Maunganui*; sailed on October 27 for Liverpool, England; arrived November 8; proceeded by rail to Southampton; crossed the English Channel and reached Le Havre, France, November 11. The organization remained in the rest camp at Le Havre until November 26, on which date it entrained for its final destination, the Mesves hospital center. It arrived at Mesves, Department of Nièvre, intermediate section, November 27; was assigned to a section of type A wooden barracks. The hospital received some class A patients (men ready for duty) on December 5, but during its active service at Mesves only 69 medical cases were admitted.

The hospital ceased to function on February 6, 1919; the unit was transferred March 20, 1919, to Brest, from which port it sailed on April 7, 1919, on the *Graf Waldersee*; arrived at Hoboken, N. J., April 20, 1919, and passed out of existence at Camp Merritt, N. J., shortly afterwards.

PERSONNEL

COMMANDING OFFICER

Maj. Clarence M. Dollman, M. C., August 25, 1918, to February 26, 1919.
Maj. Albert M. Meads, M. C., February 27, 1919, to March 20, 1919.
Lieut. Col. Lipman M. Kahn, M. C., March 21, 1919, to demobilization.

CHIEF OF SURGICAL SERVICE

Maj. Victor N. Meddis, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Albert M. Meads, M. C.

BASE HOSPITAL NO. 76

Base Hospital No. 76 was organized June 4, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large. The organization was transferred, June 29, 1918, to Camp Devens, Mass., where it arrived July 1, and remained there in training until August 31. On September 1 the organization sailed from New York harbor; arrived at Liverpool, England, September 13; disembarked and marched to the rest camp at Knotty Ash; remained in the rest camp until September 18; proceeded by rail to Southampton; crossed the English Channel the night of September 19; reached Le Havre, France, September 20; entrained at Le Havre, September 21, for its final destination, the Vichy hospital center, Department of Allier, in the intermediate section, and arrived September 23.

Base Hospital No. 76 was the fourth hospital unit to arrive at that station, where it functioned as a part of the hospital center there. The unit was assigned 18 hotels in Vichy, and proceeded to convert them into hospital wards. The first ward was opened for patients October 7, and by November 6 all buildings were receiving patients.

¹ The statements of fact appearing herein are based on the "History, Base Hospital No. 76, A. E. F.," by First Lieut. Horace Gray, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

The normal bed capacity of the hospital was 1,500. The greatest number of sick and wounded in hospital at one time on November 30, when 1,860 were under treatment. During its period of activity, October 7, 1918, to January 31, 1919, the hospital received 2,962 surgical and 2,251 medical cases.

Due to the fact that this hospital arrived late and was not fully equipped, it received only the slightly wounded and sick; in fact, nearly all its patients were walking cases.

Base Hospital No. 76 ceased to function on January 31, 1919, and the personnel sailed from Brest, April 13, 1919, on the *Mobile*, and arrived in New York April 23, 1919. Part of the unit was demobilized at Camp Dix, N. J., May 3, 1919, and the remainder at Camp Upton, N. Y., May 12, 1919.

PERSONNEL

COMMANDING OFFICER

Capt. John McKowen, M. C., June 5, 1918, to August 11, 1918.

Lieut. Col. Lewis T. Griffith, M. C., August 12, 1918, to March 8, 1919.

Maj. Albert B. Davis, M. C., March 9, 1919, to May 12, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Roy B. Canfield, M. C.

CHIEF OF MEDICAL SERVICE

Maj. I. I. Lemann, M. C.

BASE HOSPITAL NO. 77 *

Base Hospital No. 77 was organized in June, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large. On June 30 the organization was transferred to Camp Sherman, Ohio; arrived at that station July 1, and remained in training until August 27. The unit left Camp Sherman for Camp Upton, N. Y.; arrived August 29; embarked at New York on the *Baltic* August 31; sailed for Europe September 1; arrived at Liverpool, England, September 13; disembarked and proceeded by rail to Southampton and arrived the same day. On the following day the unit crossed the English Channel and landed at Le Havre, France, September 15. After spending two days at the rest camp, the organization entrained, September 17, for its final destination, Beaune, Department Côte d'Or, in the advance section, and arrived September 19. It occupied a set of type A wooden barracks of 1,000-bed capacity, with 500 additional beds in Marquee tents. This was the third hospital unit to arrive at that station, where it formed a part of the Beaune hospital center, and began receiving patients on October 12. The hospital received both surgical and medical cases; the total number of patients admitted was 3,789, and of these, 3,505 were medical cases. Base Hospital No. 77 ceased to function March 6, 1919; part of the unit was converted into Camp Hospital No. 107, which functioned for the American University at Beaune, and another part was transferred to Allerey, where it operated Camp Hospital No. 108.

* The statements of fact appearing herein are based on the "History, Base Hospital No. 77, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. James P. Kerr, M. C. (during its entire service as a base hospital).

CHIEF OF SURGICAL SERVICE

Maj. H. C. Pitts, M. C.

CHIEF OF MEDICAL SERVICE

Maj. T. W. Grayson, M. C.

BASE HOSPITAL NO. 78 *

Base Hospital No. 78 was organized in June, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large. On June 30 the organization was transferred to Fort McHenry, Md., where it underwent training at General Hospital No. 2 there. On August 27 the unit entrained for Camp Merritt, N. J., thence after three days it proceeded to New York harbor; boarded the *Anchises*; left September 1; landed at Liverpool, England, September 13; marched to the rest camp at Knotty Ash, and remained there for four days. On September 17 the organization traveled by rail to Southampton; crossed the English Channel on the night of September 19; reached Le Havre, France, September 20; on the following day entrained for its final destination, the Justice hospital group, at Toul, Department of Meurthe-et-Moselle, in the advance section; arrived at Toul September 23, where it became a part of that hospital center. Base Hospital No. 78 was the fourth hospital unit to arrive at Toul and was assigned to the barracks of the French 1st Engineers. These barracks had a total capacity of 2,000 beds.

During the months of September and October, 1918, due to advanced position of the hospital, its activities were practically those of an evacuation hospital; the wounded were admitted directly from the field hospitals, and some were received from evacuation and mobile hospitals. This hospital was designated a surgical unit of the center, although during the influenza epidemic of the fall of 1918 a large number of medical cases were admitted. After January 30, 1919, the hospital cared for all genitourinary cases of the center. The first patients were admitted September 29. During its activity the hospital received 2,388 medical and 3,205 surgical cases, with 346 operations.

Base Hospital No. 78 ceased to function April 10, 1919, and its personnel sailed from Marseille for New York, May 29, 1919; arrived in the United States June 17, 1919, and were demobilized at Camp Dix, N. J., June 6, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. David A. Kraker, M. C., July, 1918, to February 6, 1919.

Lieut. Col. Robert Burns, M. C., February 7, 1919, to June 6, 1919.

*The statements of fact appearing herein are based on the "History, Base Hospital No. 78, A. E. F.," by Lieut. Col. Robert Burns, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Alfred P. Roope, M. C.

Lieut. Col. Robert Burns, M. C.

Maj. John B. Ferguson, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Albert J. Chatard, M. C.

Maj. Louis Poole, M. C.

BASE HOSPITAL NO. 79 ^w

Base Hospital No. 79 was organized in June, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large. The organization was transferred June 28, 1918, to Fort Des Moines, Iowa, for training. On September 2, 1918, the unit proceeded to Camp Merritt, N. J., where it remained until September 15. It then sailed from Hoboken, N. J., on the *Martha Washington*, and arrived at Brest, France, September 28. It was assigned to temporary duty at Pontanezen Barracks, Brest, assisting Camp Hospital No. 33, during the influenza epidemic. On October 13, the organization entrained for its final destination, Bazoilles-sur-Meuse, Department Vosges, in the advance section, and arrived October 16. It was the eighth hospital unit to reach Bazoilles, where it functioned as a part of the hospital center there.

The unit was assigned a section of type A wooden barracks, of 1,000-bed capacity, with emergency expansion in marquee tents to 1,600 beds. This section was operated by the unit until January 31, 1919, on which date it took over patients and equipment of Base Hospital No. 116. In addition to this, a psychiatric unit that had been connected with Base Hospital No. 116 also was taken over by Base Hospital No. 79. This psychiatric department had been operating since July 20, 1918; it occupied 7 wooden barracks, with a capacity of 80 beds; had its own trained personnel, and operated its own mess. From the date of establishment, July 10, 1918, to April 30, 1919, this department admitted 1,562 cases.

Base Hospital No. 79 ceased to function on May 1, 1919; the unit sailed from St. Nazaire for Newport News, Va., on the *Texan*, June 15, 1919; arrived in the United States June 27; and was demobilized at Camp Upton, N. Y., July 12, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. W. L. Vroom, M. C., July 30, 1918, to March 16, 1919.

Lieut. Col. Arthur S. Pendleton, M. C., March 17, 1919, to July 12, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Walter W. Crawford, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Patrick J. McDonnell, M. C.

^w The statements of fact appearing herein are based on the "History, Base Hospital No. 79, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

BASE HOSPITAL NO. 80 *

Base Hospital No. 80 was organized June 25, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large. The Unit was transferred to Camp Wheeler, Ga., and attached to the base hospital of that camp for instruction. September 12 it left Camp Wheeler; arrived at Camp Upton, N. Y., September 14, remained there five days, completing its equipment for overseas service. On September 19, the organization boarded the *Agamemnon* at Hoboken, N. J.; sailed September 20 for Europe; arrived at Brest, France, September 29; remained at Pontanezen Barracks on temporary duty at Camp Hospital No. 33 until October 6. On October 6, it proceeded to the hospital center at Beaune, for duty. It arrived at Beaune, Department of Côte d'Or, advance section, October 9.

Base Hospital No. 80 was the fourth hospital unit to arrive at that station, where it functioned as a part of the hospital center. It occupied a set of type A wooden barracks, of 1,000-bed capacity, with emergency expansion in marquee tents to 1,500 beds. The first patients were received on October 19. During its service at Beaune, the hospital admitted 2,479 medical, and 868 surgical cases.

On February 22, 1919, the unit was ordered to transfer its patients to Base Hospital No. 77, and to proceed to the hospital center at Mars-sur-Allier, Department of Nièvre, for further duty. The organization left for its station on February 24, and arrived the following day.

At Mars, the unit took over a hospital plant that had been operated by Evacuation Hospital No. 37, and prior to that by Base Hospital No. 48. During its service at Mars no patients were received by Base Hospital No. 80.

This organization ceased to function on March 27, 1919; its personnel sailed on the *Santa Terese* from St. Nazaire for New York, May 13, 1919; arrived in the United States May 24, 1919, and the entire organization was demobilized at Camp Upton, N. Y., May 31, 1919.

PERSONNEL**COMMANDING OFFICER**

Lieut. Col. James A. Mattison, M. C., June 25, 1918, to May 31, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Frank C. Kinsey, M. C.

CHIEF OF MEDICAL SERVICE

Capt. Maurice W. K. Byrne, M. C.

Capt. Charles E. Sears, M. C.

* The statements of fact appearing herein are based on the "History, Base Hospital No. 80, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

BASE HOSPITAL NO. 81 ¹

Base Hospital No. 81 was organized in February, 1918, at Fort Riley, Kans., from officers and enlisted men of the Army at large. On June 14, the organization was transferred to Camp Travis, Tex., where the officers and enlisted men were assigned to duty at the base hospital of that camp for instruction. The unit left Camp Travis on August 17; arrived at Camp Merritt, N. J., August 20; completed its overseas equipment and embarked on the *Leviathan* August 28, and sailed from New York, August 31. It arrived at Brest, France, September 7; remained there on duty at Pontanezen Barracks until September 18; proceeded to Le Mans, Sarthe; remained for three days, receiving instructions in gas defense; left on September 22 for its final destination, Bazoilles-sur-Meuse, Department of Vosges, in the advance section; arrived September 25. This was the sixth hospital unit to arrive at that station, where it functioned as a part of the hospital center. The unit occupied a section of type A wooden barracks with a normal bed capacity of 1,000. The first patients were received October 5, 1918; total number received during the active service of the hospital unit was 5,991, both surgical and medical cases.

Base Hospital No. 81 ceased to function March 31, 1919; the unit sailed from St. Nazaire June 3, 1919, on the *Amphion*; arrived at Newport News, Va., June 16, 1919, and was demobilized at Camp Dodge, Iowa, June 24, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. F. E. Bunts, M. C., July 2, 1918, to July 11, 1918.

Lieut. Col. J. E. Daugherty, M. C., July 12, 1918, to July 26, 1918.

Lieut. Col. P. J. H. Farrell, M. C., July 27, 1918, to June 24, 1919.

CHIEF OF SURGICAL SERVICE

Maj. M. A. Hanna, M. C.

Maj. H. M. Hosmer, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Edmund Moss, M. C.

Maj. Howell E. Babcock, M. C.

BASE HOSPITAL NO. 82 ²

Base Hospital No. 82 was organized in April, 1918, at Fort Riley, Kans., from officers and enlisted men of the Army at large. The unit remained in training at Fort Riley until July 17, when it was transferred to Camp Crane, Allentown, Pa., where it arrived July 19. Training was continued at Camp Crane. On August 28, the organization entrained for the port of embarkation; reached Hoboken, N. J., the following day; boarded the *Leviathan*; sailed August 31; arrived at Brest, France, September 7; remained at Pontanezen

¹ The statements of fact appearing herein are based on the "History, Base Hospital No. 81, A. E. F.," by Lieut. Col. P. J. H. Farrell, M. C., while on duty as a member of the staff of that hospital. The history is on file in the historical Division, S. G. O., Washington, D. C.—Ed.

² The statements of fact appearing herein are based on the "History, Base Hospital No. 82, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

Barracks, Brest, until September 16; entrained for the hospital center, Allerey, Department of Saone et Loire, in the intermediate section, where it was to function as a part of that hospital center; arrived at Allerey September 19, and was assigned to a section of type A barracks, called 26-A, that was being operated by a subunit from Base Hospital No. 26. Two days after its arrival at Allerey, the unit was ordered to proceed to Toul, Department Meurthe et Moselle, in the advance section, for duty; left Allerey September 25 and arrived at its new station September 27.

Base Hospital No. 82 was the fifth base hospital to arrive at Toul, where it functioned as a part of the hospital center. The organization was assigned to the Caserne Luxembourg, which had been occupied by the American Red Cross Hospital No. 114, and consisted of 10 one-story ward buildings and numerous buildings for administration, storage etc. Each ward building contained 7 wards, and from 3 to 7 small rooms. The normal capacity was 1,500 beds, with emergency expansion to 1,800 beds and cots.

The hospital began to receive patients September 29, two days after its arrival, and within a week was caring for 1,050 patients.

On January 29, 1919, the hospital plant at Caserne Luxembourg was abandoned and the unit took over the plant of Base Hospital No. 45, which had been ordered to the United States. Base Hospital No. 82 took over all patients and property of the latter at the Caserne La Marche, and functioned there until March 31. During its period of activity, the hospital received 7,725 surgical and medical cases.

On March 31, 1919, Base Hospital No. 87 relieved Base Hospital No. 82, which ceased operating on April 20, and the organization sailed from Brest May 28, 1919, on the *President Grant*; arrived in Boston, Mass., June 9, 1919, and was demobilized at Camp Devens, Mass., June 14, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. A. C. Burnham, M. C., April 29, 1918, to April 13, 1919.

Lieut. Col. C. S. Wilson, M. C., April 14, 1919, to June 14, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Bruce G. Phillips, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Charles S. Wilson, M. C.

Capt. A. B. Schwartz, M. C.

BASE HOSPITAL NO. 83 ^a

Base Hospital No. 83 was organized in April, 1918, at Fort Riley, Kans., from officers and enlisted men of the Army at large. In June, 1918, the unit was transferred to Camp Pike, Ark. On August 25, the unit was ordered to proceed to Camp Upton, N. Y., where it arrived on August 30; embarked

^a The statements of fact appearing herein are based on the "History, Base Hospital No. 83, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

the following day on the *Baltic*: left New York Harbor September 1, 1918; arrived at Liverpool, England, September 13; proceeded by rail to Southampton; crossed the English Channel on the night of September 15; reached Le Havre, France, the following day; remained at Le Havre three days awaiting orders, and then proceeded by rail to Revigny, Department of Meuse, in the advance section, where it united with Evacuation Hospital No. 15, September 22, 1918.

On October 2 the commanding officer of Base Hospital No. 83 and 5 of its medical officers, together with 20 enlisted men, were sent on detached service to Camp Du Raton, Brizeaux, Forrestiere, where a 200-bed influenza and pneumonia hospital was established as an annex to Evacuation Hospital No. 11. Officers and men were also sent on detached service to Evacuation Hospitals No. 6 and No. 7 at Souilly, to Evacuation Hospital No. 10 at Froidos, and to the American Red Cross Hospital No. 114 at Fleury.

All officers and men on detached service were returned to their proper station at Revigny on November 10, 1918, and on November 14 Base Hospital No. 83 assumed charge of the hospital at Revigny. The medical and surgical work was mostly that of an evacuation hospital in that a majority of the patients were evacuated as soon as they were in condition to travel.

The hospital functioned independently and was not a part of a hospital center. The normal capacity was 800 beds.

The hospital ceased to function on February 1, 1919, and the personnel entrained March 8 for port of embarkation at St. Nazaire; sailed April 19, on the *Mercury*, for Newport News, Va.; arrived in the United States April 30, 1919, and was demobilized at Camp Dix, N. J., May 3, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Arthur A. Small, M. C., April, 1918, to May 3, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Roderick S. Elliott, M. C.

CHIEF OF MEDICAL SERVICE

Capt. Charles G. Beall, M. C.

BASE HOSPITAL NO. 84 ^b

Base Hospital No. 84 was organized in April, 1918, at Fort Riley, Kans., from officers and enlisted men of the Army at large. The unit received preliminary training at Fort Riley, and on June 27, was transferred to Camp Bowie, Tex., where it was attached to the base hospital of that camp for further training. The organization remained at Camp Bowie until August 25, when it left for the port of embarkation; arrived at Camp Merritt, N. J., August 29; embarked on the *Talhybius*, August 31; sailed from New York on September 1; arrived at Liverpool, England, September 13; entrained

^b The statements of fact appearing herein are based on the "History, Base Hospital No. 84, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

for Southampton; arrived the same day; crossed the English Channel the following night; reached Le Havre, France, September 15. On September 16, the unit entrained for its final destination, Perigueux, Department Dordogne, base section No. 2, and arrived there September 18. It was the first hospital unit to arrive at that station, where it functioned as a part of the hospital center there. It occupied a type A unit, of 1,000-bed capacity, the buildings of which had nearly been completed on arrival of the organization.

The first convoy of patients arrived October 18, and up to February 5, 1919, a total of 2,311 patients had been received; of these, 891 were medical and 1,420 surgical cases, with 250 operations.

On February 5, 1919, Base Hospital No. 84 ceased operating; turned over its property and records to Base Hospital No. 95; sailed from Bordeaux May 11, 1919, on the *Otsego*; arrived in New York, May 26, 1919; was transferred to Camp Bowie, Tex.; and demobilized on July 12, 1919.

PERSONNEL

COMMANDING OFFICER

Capt. A. E. McReynolds, M. C., April 16, 1918, to July 15, 1918.

Lieut. Col. Peter D. MacNaughton, M. C., July 16, 1918, to September 28, 1918.

Maj. Harry A. Peyton, M. C., September 29, 1918, to October 2, 1918.

Lieut. Col. B. H. Olmstead, M. C., October 3, 1918, to February 2, 1919.

Lieut. Col. James A. Harvey, M. C., February 3, 1919, to demobilization.

CHIEF OF SURGICAL SERVICE

Maj. Harry A. Peyton, M. C.

Capt. Robert D. Gist, M. C.

CHIEF OF MEDICAL SERVICE

Maj. William R. May, M. C.

Capt. Frank D. Gorham, M. C.

BASE HOSPITAL NO. 85 *

Base Hospital No. 85 was organized in April, 1918, at Fort Riley, Kans., from officers and enlisted men of the Army at large. The organization was transferred to Fort Sill, Okla., June 24, and attached, for training, to the base hospital at that camp. On September 1 the unit left Fort Sill for Camp Merritt, N. J.; arrived September 5; embarked on the *Canada* September 7; left, September 9, for Europe; docked at Glasgow, Scotland, September 22; proceeded by rail to Southampton, England; crossed the English Channel the same night; landed in Cherbourg, France, September 23; remained in the rest camp at Cherbourg for two days; entrained for Paris September 25; arrived September 26. In Paris the organization was assigned to the Clignancourt Barracks, where it functioned as a part of the Paris district. The hospital was located in large military barracks of the French Army. The wall-inclosed

* The statements of fact appearing herein are based on the "History, Base Hospital No. 85, A. E. F.," by Capt. Roe S. Dorsett, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

space is situated on the Boulevard Ney and is an integral part of the walls of the city of Paris. All of the personnel were lodged within the walls of this institution. The capacity of the hospital was 1,500 beds. The first patients arrived October 11, 1918; during its service in Paris the hospital cared for approximately 2,500 medical and surgical cases.

On January 5, 1919, Base Hospital No. 85 was transferred to Angers, Department of Marne et Loire, base section No. 1, where it took over patients and property of Base Hospital No. 27; the latter organization having been ordered to return to the United States.



FIG. 142.—Base Hospital No. 85, Paris

Base Hospital No. 85 functioned at Angers until June 12, 1919, and during that time admitted 7,840 surgical and medical cases.

The organization sailed from St. Nazaire July 9, 1919, on the *Panaman*, arriving in New York on July 19, 1919, and was demobilized at Camp Upton, N. Y., July 25, 1919.

PERSONNEL

COMMANDING OFFICER

Capt. Robert H. Stephenson, M. C., April 16, 1918, to August 8, 1918.

Maj. Stanton A. Friedberg, M. C., August 9, 1918, to August 16, 1918.

Lieut. Col. Charles O. H. Laughinghouse, M. C., August 17, 1918, to January 29, 1919.

Col. Royal Reynolds, M. C., January 30, 1919, to February 26, 1919.

Col. William R. Eastman, M. C., February 27, 1919, to June 10, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Joshua C. Hubbard, M. C.
Maj. Charles C. Sturgeon, M. C.
Maj. John M. Firman, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Appleton H. Pierce, M. C.

BASE HOSPITAL NO. 86 ^d

Base Hospital No. 86 was organized in April, 1918, at Fort Riley, Kans., from officers and enlisted men of the Army at large; the enlisted men were practically all drafted men from the State of Oklahoma. On June 27 the organization left Fort Riley, en route to Camp Logan, Houston, Tex., where it arrived the following day. At Camp Logan the unit was trained at the camp base hospital.

On August 26 the command entrained for Camp Upton, N. Y.; arrived August 30; embarked the following day on the *Baltic*; sailed for Europe, September 1; arrived at Liverpool, England, September 13; proceeded the same day by rail to Southampton; crossed the English Channel the following night; reached Le Havre, France, September 15. On September 17 the unit entrained for its final station, the hospital center at Mesves, Department of Nievre, in the intermediate section, and arrived September 19.

Base Hospital No. 86 was the fourth hospital unit to arrive at that station, where it functioned as part of the hospital center there. The hospital occupied a section of type A wooden barracks, and began to receive patients on September 27. The normal capacity of the hospital was 1,000 beds in barracks, with crisis expansion in marquee tents to 2,400. During its activity, September 27, 1918, to March 28, 1919, the hospital cared for 1,823 surgical and 2,252 medical cases; a total of 4,956. The largest number of patients in hospital was on November 15, 1918, when 2,340 were undergoing treatment. Base Hospital No. 86 was also designated to receive all mental and tubercular cases for the entire hospital center.

The hospital ceased to function on March 28, 1919; the personnel sailed from St. Nazaire for New York May 16, 1919, on the *Dakotan*, arriving in the United States May 28, and were demobilized at Camp Dix, N. J., May 31, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Herman J. Schlageter, M. C., July 29, 1918, to April 8, 1919.
Lieut. Col. Oliver C. Hargreaves, M. C., April 9, 1919, to May 31, 1919.

CHIEF OF SURGICAL SERVICE

Maj. John H. Blackburn, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Oliver C. Hargreaves, M. C.

^d The statements of fact appearing herein are based on the "History, Base Hospital No. 86, A. E. F.," by Lieut. Col. H. J. Schlageter, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

BASE HOSPITAL NO. 87 *

Base Hospital No. 87 was organized in April, 1918, at Fort Riley, Kans., from officers and enlisted men of the Army at large. On June 26, the organization was transferred to Camp MacArthur, Tex., where it was attached to the base hospital of that camp for instruction. On September 6, the unit left Camp MacArthur for Camp Mills, N. Y., and arrived there September 10. Upon completion of its overseas equipment, the organization sailed from New York on the *Finland* on September 15; arrived at Brest, France, September 28; remained at the rest camp at Pontanezen Barracks for seven days, where the unit was equipped with gas masks and steel helmets; entrained, October 5, for its final station, the Justice hospital group, at Toul, Department of Meurthe et Moselle, in the advance section; arrived at Toul, October 8, and immediately began to function as a part of that hospital center. It was the sixth hospital unit to arrive at that station. It took over the patients, personnel, and property of the Justice Gas Hospital and Neurological Hospital No. 2.

The gas hospital was located in the Caserne La Marche annex, which consisted of a number of large stone and cement buildings, with a bed capacity of 1,000, and was designated Base Hospital No. 87-A.

Neurological Hospital No. 2, occupied a part of the Caserne Fabvier, with a bed capacity of 700, and was designated Base Hospital No. 87-B.

After the armistice began, section A was designated to receive all respiratory diseases and section B was used exclusively as a genitourinary hospital. In March, 1919, section B was abandoned and on April 1, 1919, the Base Hospital No. 87 took over patients and property of Base Hospital No. 82, in the Caserne La Marche.

During its active service, October 9, 1918, to April 26, 1919, the hospital admitted 7,431 patients; of these, 5,718 were medical, 630 surgical, and 1,083 gas cases.

Base Hospital No. 87 ceased to function on April 27, 1919, and the personnel returned to the United States, sailing from Brest, June 10, 1919, on the *Agamemnon*; arrived in the United States June 18, 1919, and were demobilized at Camp Funston, Kans., June 23, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. R. D. Harden, M. C., July 27, 1918, to April 8, 1919.

Lieut. Col. O. H. Campbell, M. C., April 9, 1919, to June 23, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. B. F. Alden, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. O. H. Campbell, M. C.

* The statements of fact appearing herein are based on the "History, Base Hospital No. 87, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

BASE HOSPITAL NO. 88^f

Base Hospital No. 88 was organized in April, 1918, at Fort Riley, Kans., from officers and enlisted men of the Army at large. On June 24, the organization was transferred to Camp Dodge, Iowa, and was assigned to the base hospital of that camp for duty and instruction. On September 11, the unit left Camp Dodge, en route to Camp Upton, N. Y.; arrived September 14; embarked, September 19, on the *America*; sailed, September 20, for Brest, France; arrived, September 29; disembarked, October 1, and encamped at Pontanezen Barracks, where it remained for six days assisting various organizations in caring for sick during the influenza epidemic.

On October 7, the organization entrained for its final destination, Langres, Department of Haute Marne, advance section, and arrived October 11. This hospital was the second hospital unit to arrive at that station, where it functioned as a part of the hospital center. It occupied a section of type A wooden barracks, of 1,000-bed capacity, with an emergency expansion in marquee tents to 1,500. The first convoy of patients was received October 15; during its stay at Langres, the hospital cared for 4,691 surgical and medical cases.

On January 11, 1919, the hospital turned over its patients and equipment to Base Hospital No. 53; proceeded to the hospital center at Savenay, Department of Loire Inferieure, for duty; arrived January 16, took over patients and equipment of Base Hospital No. 69, which was a well organized and equipped 2,500-bed hospital, and immediately began to function as a part of the Savenay hospital center. This hospital was designated as a special hospital for all genitourinary cases at that center. Up to March 31, 1919, the hospital cared for 4,898 patients.

Base Hospital No. 88 ceased to function July 7; the personnel sailed from St. Nazaire for New York July 13, 1919 on the *Sierra*; arrived in the United States July 23, and were demobilized at Camp Dodge, Iowa, July 30, 1919.

PERSONNEL**COMMANDING OFFICER**

Lieut. Col. A. S. Begg, M. C., June 24, 1918, to July 30, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Warren A. Dennis, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Joseph L. Edward, M. C.

BASE HOSPITAL NO. 89^g

Base Hospital No. 89 was organized in April, 1918, at Fort Riley, Kans., from officers and enlisted men of the Army at large. On June 21, the unit left Fort Riley for Camp Sheridan, Ala., where it arrived June 23. At Camp

^f The statements of fact appearing herein are based on the "History, Base Hospital No. 88, A. E. F.," by the commanding officer of the hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

^g The statements of fact appearing herein are based on the "History, Base Hospital No. 89, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

Sheridan the organization was attached to the base hospital of that camp for instructions. On September 1, the command entrained for Camp Merritt, N. J., arrived September 3 and remained for five days, completing its equipment. The unit embarked on the *Nelens*; sailed from New York on September 9; landed at Glasgow, Scotland, September 22; entrained the same day for Southampton, England; arrived the following day; crossed the English Channel the same night; reached Le Havre, France, September 23; proceeded by rail to its final destination, Mesves, Department of Nièvre, in the intermediate section; arrived September 26. It was the sixth hospital unit to arrive at that station, where it functioned as a part of the hospital center.

The unit occupied a section of type A wooden barracks, the construction of which had not yet been completed. The bed capacity of hospital was 1,000 in barracks, with crisis emergency expansion to 2,190 beds. This included tents and all available space in the recreation hall and personnel quarters.

The first patients were received on October 7, when 630 ambulatory patients were received, and on the following day an additional 800 cases were admitted; the largest number of patients treated at one time was 2,186, on November 13. Base Hospital No. 89 received both surgical and medical cases; up to January 25, 1919, a total of 3,843 had been admitted.

Base Hospital No. 89 ceased to function as a hospital on April 19, 1919; the personnel sailed from Brest for New York May 22, 1919, on the *Louisville*; arrived in United States May 31, 1919, and were demobilized at Camp Dix, N. J., July 12, 1919.

PERSONNEL

COMMANDING OFFICER

Capt. Fred F. Schwartz, M. C., June 12, 1918, to July 28, 1918.

Lieut. Col. Ross H. Skillern, M. C., July 29, 1918, to December 13, 1918.

Maj. Thomas G. Nelan, M. C., December 14, 1918, to February, 1919.

Maj. J. S. Fielden, M. C., February, 1919, to July 12, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Thomas P. Lloyd, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Walter S. Lucas, M. C.

BASE HOSPITAL NO. 90^a

Base Hospital No. 90 was organized in June, 1918, at Fort Riley, Kans., from officers and enlisted men of the Army at large, and trained at that station until October 27. From Fort Riley the organization proceeded to Camp Merritt, N. J.; arrived October 30; remained completing its equipment until November 10, when it embarked and sailed on the *Mauretania*; reached Liverpool, England, November 17; entrained the same day for the rest camp at Winchester; arrived the following day; crossed the English Channel and landed

^a The statements of fact appearing herein are based on the "History, Base Hospital No. 90, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

at Le Havre, France, November 19; remained awaiting orders for 10 days; proceeded by rail to its station, Commercy, Department Meuse, advance section, on November 29; arrived there December 1. It was the second hospital unit to reach that station, where it formed a part of a two-unit hospital center. The organization took over the Caserne Lerouville, and proceeded to convert its buildings into a hospital. During its stay at Commercy it did not function as a hospital, but a number of its officers and men assisted Base Hospital No. 91, which was operating a hospital at that station, in caring for its patients. On January 7, 1919, the unit was transferred to Chaumont, Department of Haute Marne, in the advance section, where it took over the patients and equipment of Base Hospital No. 15. Base Hospital No. 90 ceased to function on June 8, 1919, and the personnel returned to the United States; sailed June 26, 1919 on the *Mongolia*; arrived in New York July 6, 1919, and were demobilized at Camp Custer, Mich., July 12, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. W. P. Morrill, M. C., August 9, 1918, to January 5, 1919.

Lieut. Col. Harry T. Summerhill, M. C., January 6, 1919, to February 28, 1919.

Lieut. Col. Harry G. Ford, M. C., March 1, 1919, to June 10, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. H. F. Connally, M. C.

CHIEF OF MEDICAL SERVICE

Maj. James D. Pilcher, M. C.

BASE HOSPITAL NO. 91¹

Base Hospital No. 91 was organized June 16, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large. The command received preliminary training at Camp Greenleaf, and on August 15 was transferred to Camp Gordon, Ga., where it was attached to the camp base hospital for further instructions.

The organization remained in training at Camp Gordon until October 31, when it entrained for Camp Upton, Long Island, N. Y.; arrived November 2; remained and completed its equipment, until November 9. On November 10 the unit boarded the *Mauretania*; left New York Harbor the same day; arrived at Liverpool, England, November 17; proceeded by rail to the rest camp at Winchester; left on November 19 for Southampton; crossed the English Channel the same day; disembarked at Le Havre, France, November 20; remained encamped at Le Havre until November 27; proceeded by rail to its final station, Commercy, Department of Meuse, in the advance section; arrived November 30. This was the first hospital unit to be permanently assigned to that station, which was to become a small hospital center. Upon arrival at Commercy the

¹ The statements of fact appearing herein are based on the "History, Base Hospital No. 91, A. E. F.," by Capt. F. L. Burch, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

unit took over the hospital in the Caserne Oudinot, which was being operated by Evacuation Hospital No. 13. The hospital plant consisted of several stone buildings, which were found in a good condition and contained 450 patients. The normal bed capacity of the hospital was 1,000 with an emergency expansion to 1,500; the largest number of patients in hospital was on January 24, 1919, when 1,458 were under treatment.

Base Hospital No. 91 ceased to function July 1, 1919, and the personnel sailed July 22, 1919, for the United States from Brest on the *Pocahontas*; arrived August 1, 1919, and were demobilized at Camp Upton, N. Y., August 5, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Harry T. Summergill, M. C., July 8, 1918, to January 6, 1919.

Lieut. Col. Warren P. Morrill, M. C., January 7, 1919, to February 13, 1919.

Lieut. Col. Thomas J. Leary, M. C., February 14, 1919, to June 15, 1919.

Lieut. Col. George C. Dunham, M. C., June 16, 1919, to demobilization.

CHIEF OF SURGICAL SERVICE

Maj. James G. Flynn, M. C.

Maj. Harry Gross, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Harry Gross, M. C.

Capt. Hugh P. Boswell, M. C.

Maj. S. B. Newton, M. C.

BASE HOSPITAL NO. 92ⁱ

Base Hospital No. 92 was organized June 17, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large. The command received its preliminary training at that camp, and on August 18 was transferred to Camp Greene, N. C., for further instruction. The unit remained at Camp Greene until October 27; entrained for Camp Merritt, N. J.; arrived there the following day; proceeded to New York on November 10; boarded the *Mau-retainia* and left New York for Europe the same day; disembarked at Liverpool, England, November 17; entrained for the rest camp at Winchester; arrived the following day; proceeded to Southampton November 19; crossed the English Channel and landed at Le Havre, France, November 20.

After a rest of three days the organization proceeded to Pontanezen Barracks, near Brest, where it remained in the rest camp for one week. Base Hospital No. 92, while with the American Expeditionary Forces, did not work as a unit, but as groups between Pontanezen and Kerhuon, at Camp Hospital No. 33, and with Base Hospitals Nos. 65 and 105.

ⁱ The statements of fact appearing herein are based on the "History, Base Hospital No. 92, A. E. F.," by First Lieut. Albert A. Shapiro, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

The unit was skeletonized February 10, 1919; a small detachment sailed from Brest March 23, 1919, on the *Aquitania*; arrived in the United States March 30, and was demobilized at Camp Upton, N. Y., shortly afterward.

PERSONNEL

COMMANDING OFFICER

Maj. J. C. Friedman, M. C., August 30, 1918, to September 30, 1918.

Maj. J. A. Livingston, M. C., October 1, 1918, to December 17, 1918.

Maj. J. C. Friedman, M. C., December 18, 1918, to February 10, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Josiah M. Slemane, M. C.

CHIEF OF MEDICAL SERVICE

Maj. J. C. Friedman, M. C.

BASE HOSPITAL NO. 93 ^k

Base Hospital No. 93 was organized July 15, 1918, at Camp Lewis, Wash., from officers and enlisted men of the Army at large, and remained in training until the last week of September, 1918, when the organization was ordered to proceed to San Francisco, Calif., where it arrived October 10. Orders for its embarkation at San Francisco were changed to embarkation at an eastern port, and the unit proceeded by rail to Camp Mills, N. Y., where it arrived October 16. At Camp Mills the organization was broken up into several groups and assigned to various transports for transportation overseas. The organization left New York Harbor in the convoy, October 19, and arrived at Liverpool, England, October 31. Here the command was reassembled and then proceeded by rail to Southampton; arrived the following morning; crossed the English Channel the night of November 3; landed at Le Havre, France, November 4; entrained the following day for its station at Le Mont Dore, Department Puy de Dome, intermediate section; arrived November 6.

Base Hospital No. 93 was the only hospital at that station, but functioned as a part of the Clermont-Ferrand hospital center. The unit occupied the hotel Sarciron, which was the largest and most modern hotel in the city, and reported ready for patients two days after its arrival; the first patients were received November 11, 1918. The bed capacity of the hospital was 717; total number of patients admitted was 970. The unit functioned at Le Mont Dore for little over a month; was transferred, December 18, to Cannes, Alpes Maritimes, base section No. 6, for duty; arrived at its new station December 22, and immediately began to function as a part of the Riviera hospital center.

At Cannes the unit took over four large hotels and converted them into hospitals; these hotels were admirably suited to hospital purposes, and had a bed capacity of 1,450. Each hotel was in charge of an officer, who was

^k The statements of fact appearing herein are based on the "History, Base Hospital No. 93, A. E. F.," by Capt. Arthur C. Johnson, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

responsible to the commanding officer for its proper administration. The first convoy of patients arrived January 19, 1919, and up to April 1, 1919, 3,669 surgical and medical cases were admitted.

Base Hospital No. 93 ceased to function on May 10, 1919; the personnel returned to the United States on the *Patria*; sailed from Marseille June 7, 1919; arrived at Camp Merritt, N. J., June 22, and were demobilized shortly afterward.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. J. D. Whitham, M. C., August 26, 1918, to May 3, 1919.

Maj. James Hamilton, jr., M. C., May 4, 1919, to demobilization.

CHIEF OF SURGICAL SERVICE

Maj. Joseph K. Swindt, M. C.

CHIEF OF MEDICAL SERVICE

Maj. William G. Cassels, M. C.

BASE HOSPITAL NO. 94¹

Base Hospital No. 94 was organized July 23, 1918, at Camp Cody, N. Mex., from officers and enlisted men of the Army at large, and was equipped and received training at that camp until October 8, when the command entrained for Camp Upton, Long Island, N. Y., where it arrived October 13. During this trip, a large part of the personnel was taken sick with influenza, necessitating leaving 35 men behind when the unit left for overseas. On October 19, the organization embarked on the *Walmer Castle* sailed from New York Harbor the same day; arrived at Liverpool, England, October 31; entrained for Southampton the same day; arrived November 1; crossed the English Channel the following night; landed at Le Havre, France, November 3; remained in the Le Havre rest camp until November 5; proceeded by rail to its final destination, Pruniers, Department Loire et Cher, in the intermediate section; arrived at Pruniers, November 7.

Base Hospital No. 94 occupied a section of wooden barracks, of 1,000-bed capacity. The hospital was not a part of any hospital center, but functioned independently. The first patients were admitted November 14, one week after its arrival. During November, 539 medical and surgical cases were received.

In February, 1919, a majority of the personnel was transferred to various organizations for duty, and on February 10, 1919, Camp Hospital No. 43 took over the patients and equipment of Base Hospital No. 94. The skeletonized unit, 1 officer and 5 enlisted men, proceeded to St. Nazaire; sailed from that port March 25, on the *Orizaba*; arrived at Camp Merritt, N. J., April 2, 1919, and was demobilized at Bowie, Tex., April 28, 1919.

¹ The statements of fact appearing herein are based on the "History, Base Hospital No. 94, A. E. F.," by Lieut. Col. Henry R. Brown, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Henry R. Brown, M. C., July 23, 1918, to February 10, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Leonard S. Willour, M. C.

CHIEF OF MEDICAL SERVICE

Capt. Brewster C. Doust, M. C.



FIG. 143.—Part of Base Hospital No. 94, Pruniers

BASE HOSPITAL NO. 95^m

Base Hospital No. 95 was organized August 17, 1918, at Camp Fremont, Calif., from officers and enlisted men of the Army at large. The organization was attached to the base hospital at that camp for temporary duty and there received its training. The command left Camp Fremont for Camp Upton November 4; arrived November 10; remained for four days completing its overseas equipment; proceeded to New York on November 15; boarded the *La France* and sailed the same day for Brest, France; arrived November 22.

^m The statements of fact appearing herein are based on the "History, Base Hospital No. 95, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

After several days of rest at the Pontanezen Barracks, the organization proceeded by rail to its final destination, Perigueux, Department of Dordogne, base section No. 2, and arrived December 3. This was the second hospital unit to reach that station, where it functioned as a part of the hospital center. It occupied a section of type A barracks, with a bed capacity of 1,000. The first convoy of patients arrived on December 15, 1918. During January, 1919, this hospital was designated as one of the orthopedic hospitals of the American Expeditionary Forces, and a great many orthopedic cases were received from the medical formations in the advance section.

Base Hospital No. 95 ceased to function May 16, 1919, and the personnel left for Bordeaux on May 31, for embarkation to the United States. Embarked on the *Ohioan*; sailed for New York June 9, 1919; arrived in the United States on June 21, 1919; were demobilized at Fort D. A. Russell, Wyo., July 1, 1919.

PERSONNEL

COMMANDING OFFICER

Maj. Edward A. Coates, M. C., August 19, 1918, to February 2, 1919.
Lieut. Col. B. H. Olmstead, M. C., February 3, 1919, to July 1, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Benjamin F. Cunningham, M. C.
Maj. Harry J. Craycroft, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Roy A. Brown, M. C.

BASE HOSPITAL NO. 96 ^a

Base Hospital No. 96 was organized in September, 1918, at Camp Kearny, Calif., and received its training at that camp. The unit left Camp Kearny on October 15 en route to Camp Upton, N. Y.; arrived October 20; remained there completing its overseas equipment until October 27. During this time, influenza broke out among its members, and when the unit sailed it left 65 of its men behind. On October 27, the organization left New York harbor on the *Orea*; arrived at Liverpool, England, November 8; proceeded by rail to Southampton, and crossed the English Channel on the following day; landed at Le Havre, France, November 11; remained at the Le Havre rest camp until November 28; entrained for its final destination, the hospital center at Beaune, Depart-Cote d'Or, in the advance section; arrived November 30. It was the fifth hospital unit to arrive at that center. It was assigned a section of type A wooden barracks, of 1,000-bed capacity. The unit never functioned as a hospital in the American Expeditionary Forces, and the majority of its personnel was transferred to other hospitals for duty.

The skeletonized unit sailed from St. Nazaire for Newport News, Va., April 20, 1919, on the *Finland*; arrived in United States May 1, 1919, and was demobilized at the Presidio of San Francisco, Calif., May 26, 1919.

^a The statements of fact appearing herein are based on the "History, Base Hospital No. 96, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Robert Smart, M. C., September, 1918, to February 19, 1919.

Capt. Leon Jacobs, M. C., February 20, 1919, to May 26, 1919.

CHIEF OF SURGICAL SERVICE

Capt. Ralph Hagan, M. C.

CHIEF OF THE MEDICAL SERVICE

Capt. Leon Jacobs, M. C.

BASE HOSPITAL NO. 97 °

Base Hospital No. 97 was organized June 25, 1918, at Camp Newton D. Baker, El Paso, Tex., from officers and enlisted men of the Army at large. August 14, the unit was moved to Camp Fort Bliss, El Paso, Tex., where it received its training. A majority of the personnel was assigned to the base hospital at Fort Bliss for temporary duty. On October 20, the command left Fort Bliss, en route to Camp Mills, Long Island, N. Y.; arrived October 25; boarded the *Balmoral Castle* at New York; sailed October 27 for Liverpool, England; landed November 8; entrained the following day for Southampton; crossed the English Channel from that port on November 10; reached Le Havre, France, November 11; remained at the Le Havre rest camp until November 28; entrained for Allerey, Department of Saone et Loire, intermediate section; arrived November 30. It was the seventh hospital unit to reach Allerey, where for a short time it functioned as a part of that hospital center. The organization was assigned to a section of type A barracks, which had been operated by a subunit from Base Hospital No. 70, and contained 748 convalescent patients on December 10, when the transfer was made.

Base Hospital No. 97 functioned as a hospital from December 10 to 28, on which date the commanding officer of the hospital center ordered it to be converted into an evacuation unit, and from that time on the unit handled only class A men. On February 28, 1919, the unit ceased to function and the majority of the personnel was assigned to various organizations for duty.

The skeletonized Base Hospital No. 97 returned to the United States on the *Graf Waldersee*, sailing from Brest on April 7, 1919; arrived at Hoboken, N. J., April 20, and was demobilized at Camp Dix, N. J., April 22, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. J. E. Dougherty, M. C., June 25, 1918, to April 22, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Charles D. Bodine, M. C.

CHIEF OF MEDICAL SERVICE

Capt. Thad Shaw, M. C.

* The statements of fact appearing herein are based on the "History, Base Hospital No. 97, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

BASE HOSPITAL NO. 98 ^p

Base Hospital No. 98 was organized in July, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large. On August 6, the command was transferred to Camp Hancock, Ga., where it received its training and was attached to the base hospital of that camp for instruction. The organization left Camp Hancock for Camp Merritt, N. J., October 3, and remained there on temporary duty, assisting at the base hospital during the influenza epidemic. On November 10, it left Camp Merritt, N. J., for New York; boarded the *Empress of Russia*; sailed on November 12 for Brest, France; arrived November 22; proceeded to the rest camp at Pontanezen Barracks, where it remained until November 29; entrained for Paris; arrived the following day. In Paris, the unit was assigned to duty at the convalescent camp, which had been established on the race track at Tremblay, Nogent sur Marne. On December 20, the hospital was ordered to proceed to Lourdes, Department of Haute Pyrenees, in base section No. 2; arrived December 22, and was assigned a number of hotels in which the unit was to operate a hospital. On January 1, 1919, the project of establishing a hospital at Lourdes was abandoned and Base Hospital No. 98 was ordered to Limoges for duty; entrained on January 22; arrived at Limoges, Department Haute Vienne, base section No. 2, January 23. At Limoges it relieved Base Hospital No. 28 and took over its patients and equipment and assumed full charge on February 1, 1919. In March, 1919, the entire hospital plant was abandoned and all patients and personnel were moved to the Bellaire Seminary, which prior to that had been used as an annex to the hospital. The capacity of the hospital was reduced to 200 beds, and the hospital served only the troops stationed in Limoges.

Base Hospital No. 98 ceased to function on May 23, 1919; the personnel sailed from Bordeaux for New York, June 9, 1919, on the *Ohioan*; arrived in the United States June 21, and were demobilized at Camp Dix, N. J., June 23, 1919.

PERSONNEL**COMMANDING OFFICER**

Lieut. Col. Walter Bensel, August 24, 1918, to December 27, 1918.

Maj. Charles H. Weber, December 28, 1918, to June 23, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Henry M. Chapman.

CHIEF OF MEDICAL SERVICE

Maj. James W. Barrow.

BASE HOSPITAL NO. 99 ^q

Base Hospital No. 99 was organized August 22, 1918, at Camp Custer, Mich., from officers and enlisted men of the Army at large, and received its training at the camp base hospital. After two months of training, the command

^p The statements of fact appearing herein are based on the "History, Base Hospital No. 98, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

^q The statements of fact appearing herein are based on the "History, Base Hospital No. 99, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

proceeded by rail to Camp Merritt, N. J.; arrived October 22; sailed from New York harbor October 27, on the *Minnekahda*; arrived at Liverpool, England, November 8; entrained the same day for Southampton; arrived the following day; crossed the English Channel during the night of November 10; landed at Le Havre, November 11; remained at the Le Havre rest camp until November 22; left for its station at Hyeres, Department of Var, base section No. 6; arrived November 26. It was the first hospital unit to arrive at that station, where it took over United States Convalescent Hospital No. 1, and became a part of the Riviera hospital center. The hospital functioned as a convalescent hospital. The plant consisted of 10 buildings, situated from one-half mile to 5 miles apart; prior to their being taken over by the United States Army the various buildings had been hotels. Hyeres is one of the popular resorts on the Riviera and is an ideal place for a convalescent hospital. The hospital had a bed capacity of 3,638; during its period of activity, November 26, 1918, to May 1, 1919, it handled over 8,000 medical and 2,147 surgical cases.

Base Hospital No. 99 ceased to function May 10, 1919, and the unit left Hyeres for Marseille, May 20, 1919; sailed May 31, 1919, on the *Duca D'Abruzzi* for New York; arrived, June 18, 1919, and was demobilized at Camp Custer, Mich., June 27, 1919.

PERSONNEL

COMMANDING OFFICER

Maj. Maynard L. Simmons, M. C., August 22, 1918, to March 26, 1919.
Lieut. Col. Leopold Mitchell, M. C., March 27, 1919, to May 1, 1919.
Lieut. Col. George C. Dunham, M. C., May 2, 1919, to May 15, 1919.
Maj. Frederick C. Warnshuis, M. C., May 16, 1919, to June 27, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Frederick C. Warnshuis, M. C.

CHIEF OF MEDICAL SERVICE

Capt. Nelson W. Janney, M. C.
Maj. Joseph Catton, M. C.

BASE HOSPITAL NO. 100^{*}

Base Hospital No. 100 was organized, July 12, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large. On August 21, the command was transferred to Camp Custer, Mich., where it was assigned to the camp base hospital for training. On October 30, 1918, the organization entrained at Camp Custer for Camp Upton, N. Y.; arrived November 1; remained until November 10; proceeded to the port of embarkation; sailed on the *Mauretania* on the same day; arrived at Liverpool, England, November 17; entrained for Winchester; arrived the following day; left the Winchester rest camp for Southampton November 19; crossed the English Channel;

^{*} The statements of fact appearing herein are based on the "History, Base Hospital No. 100, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

landed at Le Havre, France, November 20; entrained on November 21 for its final station at Savenay, Department Loire Inferieure, base section No. 1; arrived on November 23.

Base Hospital No. 100 was the fifth hospital unit to reach Savenay, where it functioned as a part of the hospital center. It was assigned to a type A, 1,000-bed hospital, already under operation as an auxiliary to Base Hospital No. 8, but not fully completed. This hospital consisted of 19 buildings of frame construction and 5 of cement. After its arrival, six frame barracks were erected, to be used for the hospital personnel. It was used largely as a receiving and evacuating hospital for walking cases. On the date of its arrival, the hospital was filled with 1,109 patients. During its period of activity, November 23, 1918, to June 21, 1919, the hospital handled 11,081 patients.

The hospital ceased to function, June 21, 1919, and the personnel sailed from St. Nazaire July 5, 1919 on the *South Bend*; arrived in the United States July 15, and were demobilized at Camp Sherman, Ohio, July 20, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Frederick H. Newberry, M. C., August 16, 1918, to April 10, 1919.

Maj. Mortimer Warren, M. C., April 11, 1919, to July 20, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Hammer C. Irwin, M. C.

Maj. Lawrence H. Hoffman, M. C.

Maj. Josiah R. McKirahan, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Mortimer Warren, M. C.

Maj. John A. Dodd, M. C.

BASE HOSPITAL NO. 101 *

Base Hospital No. 101 came into existence about July 5, 1917, at St. Nazaire, Department Loire Inferieure, base section No. 1, the personnel being taken from the Medical Department of the 1st Division, and Base Hospital No. 18. All members of Base Hospital No. 18 were replaced in August, 1917, by officers and men from Base Hospital No. 8, who in turn were relieved in October, 1917, by a casual medical detachment of the Regular Army.

Base Hospital No. 101 was the first base hospital to operate with the American Expeditionary Forces, and when organized was United States Army Hospital No. 1, which subsequently was changed to Base Hospital No. 101. The hospital was located in the Municipal College of St. Nazaire, and had been used as a military hospital by the French Army during the three years preceding. When taken over by us the hospital contained about 290 sick American soldiers and civilian employees.

* The statements of fact appearing herein are based on the "History, Base Hospital No. 101, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

During its first year of service practically all the patients admitted were from incoming transports; on October 6 and 7, 1918, over 900 cases of influenza and severe cases of pneumonia were received from the *Princess Matoika*, the *Mongolia*, and the *President Grant*. The number of deaths was quite appalling and occurred directly after admission to the hospital. At this time the capacity of the hospital was very much overtaxed and cots and bed sacks were placed in every available shelter to accommodate incoming patients.

The normal capacity of the hospital was 1,020 beds, with an emergency expansion to 1,500. During its period of activity it cared for about 20,000 surgical and medical cases.

Besides being the first base hospital to function with United States troops in France, Base Hospital No. 101 was one of the last hospitals to cease operations. It closed its doors on June 20, 1919, and the personnel sailed from Marseille June 28, 1919, on the *Marica*. Upon arrival in New York, July 9, 1919, the organization was split up and sent to various camps for demobilization.

PERSONNEL

COMMANDING OFFICER

Col. George P. Peed, M. C., July 5, 1917, to July 14, 1917.

Maj. Wayne H. Crum, M. C., July 15, 1917, to January 14, 1918.

Col. Albert S. Bowen, M. C., January 15, 1918, to September 22, 1918.

Lieut. Col. William B. Meister, M. C., September 23, 1918, to June 5, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Harvey Stone, M. C.

Maj. James A. Duff, M. C.

Maj. E. L. Gilchrist, M. C.

Maj. Thomas Mullen, M. C.

Maj. P. Nesbitt, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Henry C. Thacher, M. C.

Maj. Milton B. Katzenstin, M. C.

BASE HOSPITAL NO. 102¹

Base Hospital No. 102 was organized in February, 1918, at San Juan, P. R., from officers and enlisted men of the Army at large. The unit was transferred to Camp Beauregard, La., where it completed its training. In July, 1918, the organization proceeded to Fort McHenry, Md., where it arrived on July 24, and was attached to General Hospital No. 2 for temporary duty. On August 4, the unit proceeded to Baltimore, Md.; embarked the same day on the *Umbria*; sailed for Genoa, Italy; arrived at Genoa, August 27; remained, awaiting orders, until September 6; proceeded to its station at Vicenza, Italy; arrived there the following day.

¹ The statements of fact appearing herein are based on the "History, Base Hospital No. 102, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

This unit was sent to Italy for service with the Italian Army. Previous to the signing of the armistice this hospital was not open to medical cases, particularly cases of chronic nature, such as venereal diseases. The entire hospital and personnel were held in reserve for casualties evacuated from the front. However, in September, arrangements were made whereby medical and other cases of the American Forces were accepted regardless of their nature. Later the hospital acquired an additional building accommodating about 400 beds, and converted it into a hospital for medical cases; the original hospital now was used entirely for surgical cases.

During the period this hospital was in operation 397 Americans were admitted and treated. This small number represented only a very small per cent of the total cases admitted, the great majority coming from the Italian forces at the front and elsewhere. This was the only base hospital on duty with the Italian forces and was in active operation from September 29, 1918, to March 31, 1919.

On March 31, Base Hospital No. 102 ceased to function and proceeded to Genoa for embarkation to the United States and sailed from that port April 7, 1919, on the *Duca D'Abruzzi*. Upon arrival in the United States, April 23, 1919, the organization was sent to Camp Shelby, Miss., where it was demobilized shortly afterwards.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Edgar E. Hume, M. C., July 6, 1918, to February 21, 1919.

Lieut. Col. Joseph A. Danna, February 22, 1919, to demobilization.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Joseph A. Danna, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. William L. Dunn, M. C.

BASE HOSPITAL NO. 103 *

Base Hospital No. 103 was organized in May, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large. On August 21 the command was transferred to Fort Sheridan, Ill., where it arrived August 22, and completed its training. It entrained October 15 for Camp Upton, N. Y.; arrived October 17; remained until October 25; embarked from New York on the *Leviathan* October 25; sailed October 27. The *Leviathan* arrived in Liverpool November 3; from there the unit proceeded by rail to Winchester; arrived at Winchester November 4; remained in the rest camp until the following day; proceeded by rail to Southampton; crossed the English Channel the same night and landed at Le Havre, France, November 6; entrained the following day for its final destination, the hospital center at Clermont-

* The statements of fact appearing herein are based on the "History, Base Hospital No. 103, A. E. F.," by Capt. Henry E. Melany, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

Ferrand, Department Puy de Dome, in base section No. 2; arrived November 9. Base Hospital No. 103 was the fourth hospital unit to arrive at that station and became a part of the hospital center. The unit was assigned a convent school and French artillery barracks, with a total bed capacity of 2,600. Shortly after the arrival of the organization the hospitalization project at Clermont-Ferrand was abandoned and the unit, without having functioned as a hospital, was ordered to Dijon for duty.

Base Hospital No. 103 left its station on January 1, 1919, and arrived at Dijon, Department Cote d' Or, in the advance section, January 2. At Dijon the organization relieved Base Hospital No. 17, and transfer of patients and equipment was completed on January 9. The hospital contained 1,139 pa-



FIG. 144.—Main building, Base Hospital No. 103, Dijon.

tients when taken over; and as Base Hospital No. 103 was short of personnel some of the members of Base Hospital No. 17 remained on duty with the new command.

On February 5 four cases of smallpox broke out in the command and the entire hospital was placed in quarantine. During this time no patients were being evacuated, and at the end of the quarantine, February 20, the hospital contained 1,786 patients, the largest number ever treated at one time. During its period of activity the hospital cared for 7,563 surgical and medical cases, with 306 operations.

Base Hospital No. 103 ceased to function June 12, 1919; the personnel sailed from Brest July 1, 1919, on the *Great Northern*; arrived at New York July 6, 1919, and were demobilized at Camp Funston, Kans., July 15, 1919.

PERSONNEL

COMMANDING OFFICER

Maj. John N. Teeter, M. C., August 23, 1918, to October 24, 1918.

Lieut. Col. John C. Morfit, M. C., October 25, 1918, to January 20, 1919.

Lieut. Col. H. H. Van Kirk, M. C., January 21, 1919, to July 15, 1919.

CHIEF OF SURGICAL SERVICE

Capt. John R. Vaughan, M. C.

CHIEF OF MEDICAL SERVICE

Maj. John N. Teeter, M. C.

BASE HOSPITAL NO. 104 *

Base Hospital No. 104 was organized July 12, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large. On August 12 the unit was transferred to Camp Dodge, Iowa, for training.

On October 31 the command entrained for Camp Upton, Long Island, N. Y., where it arrived November 2. It remained, completing overseas equipment, until November 10; embarked on the *Mauretania*; sailed the same day for Europe; arrived at Liverpool, England, November 17; proceeded by rail to the rest camp at Winchester; remained until November 19; proceeded to Southampton; crossed the English Channel November 20; landed at Le Havre, France, November 21; entrained the same day for its final destination, the hospital center at Beau Desert, Department Gironde, base section No. 2, where it arrived November 24.

Base Hospital No. 104 was the fourth hospital unit to arrive at Beau Desert, where it functioned as a part of the hospital center. The unit was assigned for temporary duty with Base Hospital No. 22, until December 18, when it took charge of a section of type A wooden barracks, and began to function as a hospital. The normal capacity was 1,000 beds, with emergency expansion to 1,660. During its period of activity, December 18, 1918, to May 31, 1919, the unit cared for 7,127 surgical and medical cases.

Base Hospital No. 104 operated as a receiving hospital for the center, the class of patients handled being noncontagious and nonvenereal, the majority being convalescents. Practically all officer patients admitted to the center were handled through this hospital.

Base Hospital No. 104 ceased to function May 31, 1919, and the personnel sailed for the United States from Bordeaux June 10 on the *Iowan*; arrived in New York June 22; were demobilized at Camp Dix, N. J., on June 25, 1919.

* The statements of fact appearing herein are based on the "History, Base Hospital No. 104, A. E. F.," by Lieut. Col. James S. Hammers, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Charles A. E. Codman, M. C., August 23, 1918, to November 2, 1918.

Lieut. Col. James S. Hammers, M. C., November 3, 1918, to May 31, 1919.

Capt. John A. Green, M. C., June 1, 1919, to June 25, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Frank R. Sheppard, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Charles A. E. Codman, M. C.

Capt. John A. Green, M. C.

BASE HOSPITAL NO. 105 ^w

Base Hospital No. 105 was organized July 22, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large. On August 29 the unit was transferred to Fort Benjamin Harrison, Ind., where it arrived August 31, and completed its training and equipment. The command left Fort Benjamin Harrison, October 23, en route to Camp Merritt, N. J., and arrived two days later. On October 27 it proceeded to Hoboken, N. J., where it was split up and placed on board four ships for transportation to Europe. All four groups left New York Harbor at the same time, October 28.

The convoy reached Brest, France, November 9; the unit was reassembled and sent to the rest camp at Pontanezen Barracks, where it remained until November 12, when it was transferred to the Hospital Center, Kerhuon, in base section No. 5. There the unit took charge of a section of type A barracks of 1,240-bed capacity, and began to function as an annex to Base Hospital No. 65. The nature of the work at this hospital was that of an embarkation hospital.

On February 6, 1919, the unit was skeletonized, the personnel being transferred to various organizations for duty. The skeletonized unit, consisting of 1 officer and 5 enlisted men, sailed from Brest for New York, March 16, 1919, on the *Felix Taussig*; arrived in the United States April 1, 1919, and was demobilized at Camp Dix, N. J., April 1, 1919.

PERSONNEL

COMMANDING OFFICER

Col. Edward W. Pinkham, M. C., August 31, 1918, to February 9, 1919.

First Lieut. Vernard R. Hodges, M. C., February 10, 1919, to April 1, 1919.

^w The statements of fact appearing herein are based on the "History, Base Hospital No. 105, A. E. F.," by Lieut. Col. Edward W. Pinkham, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Harry M. Lee, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Charles W. Knapp, M. C.

BASE HOSPITAL NO. 106 ^{*}

Base Hospital No. 106 was organized in August, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large. The command was transferred, on August 31, to Camp Jackson, S. C., where it was attached to the camp base hospital for temporary duty. On October 15, the organi-



FIG. 145.—Main kitchen, Base Hospital No. 106, Beau Desert hospital center

zation left Camp Jackson, S. C., for Camp Merritt, N. J., where it arrived October 17, and remained there for 10 days, completing its overseas equipment. On October 25, the unit embarked on the *Leviathan* at Hoboken, N. J.; sailed for Europe October 27; arrived at Liverpool, England, November 3; proceeded by rail to Southampton by way of Winchester; crossed the English Channel to Le Havre, France; arrived November 6.

From Le Havre the unit proceeded by rail to its final station, the hospital center at Beau Desert, Department Gironde, in base section No. 2; arrived November 10. Base Hospital No. 106 was the third hospital unit to arrive at that station, where it functioned as a part of the hospital center. It was assigned to a section of type A wooden barracks which were about 90 per cent complete, and had a capacity of 1,000 beds.

^{*} The statements of fact appearing herein are based on the "History, Base Hospital No. 106, A. E. F.," by Lieut. Col. Louis I. Mason, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

This hospital was designated as a receiving hospital for all venereal, contagious, and infectious diseases, tuberculosis and surgical chest cases for the entire center. The first patients were admitted December 4, 1918; during its period of activity, the organization cared for 4,297 medical and surgical cases; of these 735 were venereal and 865 were tuberculous patients.

Base Hospital No. 106 ceased to function May 31, 1919, and its personnel returned to the United States on the *Iowan*; sailed from Bordeaux June 10, 1919; arrived in New York June 22, 1919, and were demobilized at Camp Dix, N. J., July 12, 1919.



FIG. 146.—Interior, detachment mess, Base Hospital No. 106

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Louis I. Mason, M. C., September 17, 1918, to July 12, 1919.

CHIEF OF SURGICAL SERVICE

Maj. George W. Newell, M. C.

Maj. Walter A. Kennedy, M. C.

Capt. Daniel W. Prentiss, M. C.

Maj. Ralph Balch, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Robert B. Scales, M. C.

BASE HOSPITAL NO. 107 *

Base Hospital No. 107 was organized in July, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large. On August 27, the command was transferred to Fort Snelling, Minn., where it received further training at General Hospital No. 29. On October 25 the unit entrained at Fort Snelling for Camp Upton, Long Island, N. Y., where it arrived October 28. Two days later the unit proceeded to Hoboken, N. J.; embarked on the *Great Northern*; sailed the following day, October 31, for Europe; arrived at Brest, France, November 9; disembarked on the following day; remained at the Pontanezen rest camp until November 14; proceeded by rail to its final destination, the hospital center at Mars-sur-Alliers, Department Nièvre, in the intermediate section.

Base Hospital No. 107 arrived at Mars November 17, and was the seventh hospital unit to reach that station, where it immediately began to function as a part of the hospital center. On November 18 the unit took over a section of type A barracks that had been operated as an annex to Base Hospital No. 35, and contained 1,139 patients. The normal bed capacity of the hospital was 1,170. During its activity, November 18, 1918, to April 20, 1919, it cared for 1,267 surgical and 1,722 medical cases; the majority of whom were convalescent. This unit never had any Army nurses regularly assigned to it; but whenever needed, casual nurses were sent there for temporary duty.

Base Hospital No. 107 ceased to function April 20, 1919; the personnel sailed for New York from St. Nazaire June 23, 1919, on the *Arizonan*; arrived in the United States July 6, and were demobilized at Camp Pike, Ark., July 15, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. J. M. W. Scott, M. C., August 24, 1918, to November 21, 1918.
Maj. Scurry L. Terrell, M. C., November 22, 1918, to December 4, 1918.
Lieut. Col. J. M. W. Scott, M. C., December 5, 1918, to March 1, 1919.
Maj. N. M. Jones, M. C., March 2, 1919, to May 7, 1919.
Capt. Llewelyn R. Johnson, M. C., May 8, 1919, to July 15, 1919.

CHIEF OF SURGICAL SERVICE

Maj. N. M. Jones, M. C.
Capt. Foster K. Collins, M. C.

CHIEF OF MEDICAL SERVICE

Capt. H. Caro, M. C.
Capt. J. F. Lynn, M. C.

* The statements of fact appearing herein are based on the "History, Base Hospital No. 107, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

BASE HOSPITAL NO. 108 *

Base Hospital No. 108 was organized August 15, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large. On September 12 the command was transferred to Fort Snelling, Minn., where it was attached to General Hospital No. 29, for further instruction. The unit remained at Fort Snelling until October 25; entrained for Camp Upton, Long Island, N. Y.; arrived October 28; completed overseas equipment; October 30 proceeded to Hoboken, N. J.; embarked on the *George Washington*; sailed the following day, October 31, for Europe.

The unit arrived at Brest, France, November 9; disembarked and marched to Pontanezen Barracks; encamped and remained until November 17; proceeded by rail to its permanent station, the hospital center at Mesves, Department of Nièvre, in the intermediate section. Base Hospital No. 108 arrived at Mesves November 20 and began to function as a part of the hospital center. It occupied a section of type A barracks, the construction of which was very much incomplete when taken over. The first patients were received on November 29, 500 being admitted on that date, largely convalescent surgical and medical cases. The normal bed capacity of the hospital was 1,000; during its period of active service, November 29, 1918, to May 16, 1919, 1,290 surgical and 920 medical cases were admitted.

Base Hospital No. 108 ceased to function May 16, 1919, and its personnel sailed from St. Nazaire for New York June 23, 1919, on the *Arizonan*; arrived in the United States July 6, and were demobilized at Camp Dodge, Iowa, July 10, 1919.

PERSONNEL**COMMANDING OFFICER**

Maj. Albert Vander Veer, M. C., September 14, 1918, to November 21, 1918.

Maj. Charles T. Sturgeon, M. C., November 22, 1918, to November 25, 1918.

Col. E. H. Bruns, M. C., November 26, 1918, to December 20, 1918.

Lieut. Col. William A. Jolley, M. C., December 21, 1918, to July 10, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Charles T. Sturgeon, M. C.

Maj. Harold A. Fiske, M. C.

CHIEF OF MEDICAL SERVICE

Capt. Joseph H. Saunders, M. C.

Maj. Albert Vander Veer, M. C.

* The statements of fact appearing herein are based on the "History, Base Hospital No. 108, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

BASE HOSPITAL NO. 109 ^a

Base Hospital No. 109 was organized August 24, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large. The command was transferred on September 15, 1918, to Fort Benjamin Harrison, Ind., where it received further training. On October 18, the organization left for Camp Merritt, N. J.; arrived October 20; remained for five days, completing its overseas equipment; embarked, October 25, on the *Cretic*; left New York, October 26, for Europe; arrived at Liverpool, England, November 8; entrained the following day for Southampton; arrived November 9; crossed the English Channel on the night of November 10; landed at Le Havre, France, November 11. From Le Havre, the unit proceeded to its final station, the hospital center at Vichy, Department Alliers, intermediate section; arrived November 24, 1918.

On December 3, 1918, Base Hospital No. 109 took over four hotels, with 470 patients, from other hospitals in the center, and later, it was assigned additional buildings, so that before it ceased to function it operated in 22 separate buildings. During its period of active service, December 3, 1918, to March 12, 1919, the hospital cared for 4,700 surgical and medical cases.

The unit ceased to function as a hospital on March 12, 1919, and left Vichy, April 7, en route to Brest, where it arrived, April 10. On April 25, the organization embarked on the *Cap Finistere*, sailing the same day for Hoboken, N. J., arriving there May 5, 1919, and was demobilized at Camp Dodge, Iowa, May 16, 1919.

PERSONNEL**COMMANDING OFFICER**

Lieut. Col. Francis Vinsonhaler, M. C., September 15, 1918, to May 16, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Prince E. Sawyer, M. C.

CHIEF OF MEDICAL SERVICE

Capt. William E. Howell, M. C.

BASE HOSPITAL NO. 110 ^b

Base Hospital No. 110 was organized in August, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large. On September 11, 1918, the command was transferred to Camp Sevier, S. C., for further training. On November 1, 1918, the organization entrained for Camp Upton, Long Island, N. Y., arrived November 3; remained, completing its overseas equipment, until November 10; embarked on the *Empress of Asia*, and two days later, November 12, sailed for Europe; arrived at Brest, France, November 22, 1918; encamped at Pontanezen Barracks, and remained there until December 2; proceeded to its final station, the hospital center at Mars-sur-Alliers, Department of Nièvre, in the intermediate section; arrived December 4.

^a The statements of fact appearing herein are based on the "History, Base Hospital No. 109, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

^b The statements of fact appearing herein are based on the "History, Base Hospital No. 110, A. E. F.," by Capt. Isaac Reitzfeld, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

Base Hospital No. 110 was the eighth hospital unit to reach Mars, where it functioned as a part of the hospital center. The unit took over a section of type A wooden barracks and began to receive patients two days after its arrival.

This hospital received both medical and surgical cases, but in January, 1919, it was designated as a special hospital for neuropsychiatric cases. The normal capacity of the hospital was 1,000 beds; during its service as a hospital, December 6, 1918, to May 10, 1919, it cared for 2,885 patients, including several hundred neuropsychiatric cases.

Base Hospital No. 110 ceased to function May 10, 1919, and its personnel returned to the United States; sailed from St. Nazaire June 23, 1919, on the *Arizonan*; arrived in the United States July 6, and was demobilized at Camp Dix, N. J., July 10, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. William C. Le Compts, M. C., August 23, 1918, to April 30, 1919.

Lieut. Col. Thew Wright, M. C., May 1, 1919, to July 10, 1919.

Lieut. Col. Thew Wright was chief of both the surgical and medical services.

BASE HOSPITAL NO. 111^c

Base Hospital No. 111 was organized August 10, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large; the enlisted personnel were composed of drafted men from Oklahoma, Mississippi, and New York. The unit remained in training at Camp Greenleaf until September 10, 1918, when it was transferred to Camp Beauregard, La., where training was continued until October 29, 1918. The unit proceeded to Camp Upton, Long Island, N. Y.; arrived November 2, 1918; embarked November 10, 1918, on the *Empress of Asia*, left New York, November 12; arrived at Brest, France, November 22, 1918; proceeded to the rest camp at Pontanezen Barracks; remained there until November 25; entrained for its permanent station, the hospital center at Beau Desert, Department Gironde, base section No. 2.

Upon arrival at Beau Desert, the organization took over a type A 1,000-bed hospital and began to receive patients on December 8, 1918. On May 1, 1919, Evacuation Hospital No. 20 was relieved from duty at Beau Desert, and Base Hospital No. 111 took over its plant and equipment and functioned as an evacuation hospital for all cases en route to the United States. The medical service, in addition to its other duties, held daily sick call for 1,300 prisoners of war and three escort companies, stationed at Beau Desert. In addition to the patients handled while functioning as an evacuation hospital, the organization cared for approximately 7,000 surgical and medical cases.

Base Hospital No. 111 ceased operating on May 31, 1919, and the personnel returned to the United States; sailed from Bordeaux June 10, 1919, on the *Iowan*; arrived at Philadelphia, June 22, 1919; proceeded by rail to Camp Dix, N. J., where they were demobilized shortly afterward.

^c The statements of fact appearing herein are based on the "History, Base Hospital No. 111, A. E. F.," by Lieut. Col. James B. Woodman, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

PERSONNEL

COMMANDING OFFICER

Maj. George F. Glass, M. C., September 12, 1918, to September 30, 1919.
Lieut. Col. James B. Woodman, M. C., October 1, 1918, to demobilization.

CHIEF OF SURGICAL SERVICE

Capt. B. A. Bopp, M. C.

CHIEF OF MEDICAL SERVICE

Maj. George F. Glass, M. C.

BASE HOSPITAL NO. 112 ^d

Base Hospital No. 112 was organized in August, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large. The command was transferred on September 14 to Camp Sherman, Ohio, for further training. During the epidemic of influenza in October, 1918, the unit was assigned to the Camp Sherman base hospital for temporary duty. On October 28, the organization entrained for Camp Upton, N. Y.; arrived October 30; embarked on the *Empress of Russia*, November 10; left November 12, for Brest, France; arrived November 22, 1918. Upon arrival the unit was assigned to the Kerhuon hospital center for duty, but later the order was revoked and the unit placed under the camp surgeon, Camp Pontanezen, who assigned the officers and men to the various organizations of that camp for duty. A majority of the personnel was assigned to Camp Hospital No. 33 and the quarantine camp; others to the delousing plant, transport service and venereal camp. The organization never functioned as a hospital.

On February 7, 1919, Base Hospital No. 112 was ordered skeletonized to 1 officer and 5 enlisted men. The remainder of the unit continued their duties under the direction of the camp surgeon, Pontanezen Barracks. The skeletonized hospital sailed from Brest on the *Ulva* on March 23, 1919; arrived in the United States April 2, 1919, and was demobilized at Camp Dix, N. J., April 31, 1919.

PERSONNEL

COMMANDING OFFICER

Maj. Lewis H. McKinnie, M. C., September 30, 1918, to January 29, 1919.
Maj. Robert S. McCaughey, M. C., January 30, 1919, to February 7, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Lewis H. McKinnie, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Robert S. McCaughey, M. C.

^d The statements of fact appearing herein are based on the "History, Base Hospital No. 112, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

BASE HOSPITAL NO. 113 *

Base Hospital No. 113 was organized in August, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large. On August 20, the command was transferred to Camp Sherman, Ohio, for training at the camp base hospital. On November 1, the organization entrained for Camp Upton, N. Y., where it completed its overseas equipment, and sailed for Europe, November 12 on the *Empress of Russia*. It had arrived at Brest, France, November 22; proceeded to Savenay, Department Loire Inferieure, base section No. 1: arrived November 25.

This organization was the fifth hospital unit to arrive at Savenay, where it immediately began to function as a part of the hospital center. It was assigned to a type A, 1,000-bed hospital, which already had been in operation under Base Hospital No. 69. The hospital plant was in various stages of construction, but was completed shortly after its occupancy by Base Hospital No. 113.

The professional activities of the unit began with its arrival, November 25, but the records of the unit continued to be operated by Base Hospital No. 69 until December 19, when all were taken up by Base Hospital No. 113. At Savenay, the unit performed the usual functions of a base hospital, and up to March 31, 1919, admitted 6,338 medical and surgical cases. This unit was designated as a hospital from which all disabled nurses were to be evacuated to the United States.

Base Hospital No. 113 ceased to function as a hospital on June 30, 1919. The personnel returned on the *Santa Teresa*; sailed from St. Nazaire on July 15, 1919; arrived in New York, July 27, 1919, and were demobilized at Camp Dix, N. J., August 1, 1919.

PERSONNEL**COMMANDING OFFICER**

Maj. Edwin C. Henry, M. C., August 20, 1918, to January 26, 1919.

Maj. G. Milton Linthicum, M. C., January 27, 1919, to August 1, 1919.

CHIEF OF SURGICAL SERVICE

Maj. G. Milton Linthicum, M. C.

Maj. Charles L. Patton, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Edward T. Gallagher, M. C.

BASE HOSPITAL NO. 114 †

Base Hospital No. 114 was organized March 8, 1918, at Camp Crane, Pa., from officers and enlisted men of the Army at large, and was given intensive training at Camp Crane. On June 5, the unit proceeded by rail to Hoboken, N. J.; embarked the same day on the *Manchuria*; sailed for France June 7;

* The statements of fact appearing herein are based on the "History, Base Hospital No. 113, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

† The statements of fact appearing herein are based on the "History, Base Hospital No. 114, A. E. F.," by Lieut. Col. J. A. Talbott, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

disembarked at St. Nazaire, France, June 19; remained in the rest camp there until June 21; entrained for Beau Desert, Department Gironde, base section No. 2; arrived, June 22, 1918.

Base Hospital No. 114 was the second hospital unit to arrive at Beau Desert, where it functioned as part of the hospital center. The organization occupied a type A, 1,000-bed unit, with an emergency expansion of 500 beds; later it expanded into two additional 1,500-bed units, and on November 7, 1918, the total bed capacity was 5,400. On the same date the number of patients in hospital was 4,596, the majority of whom required dressing and constant attention. They were cared for by a personnel consisting of 18 officers, 202 enlisted men, and 67 nurses. This state of affairs existed until the latter part of November, 1918, when another hospital unit reported in the center and took over one of the units operated by Base Hospital No. 114.

After the signing of the armistice, the hospital functioned as an evacuation hospital for orthopedic cases, and continued as such until February, 1919, when it was changed to a receiving hospital. The largest number of patients admitted was in October, 1918, when 5,130 were received. During its period of activity, the organization cared for more than 17,000 medical and surgical cases.

Base Hospital No. 114 ceased to function as a hospital April 16, 1919, and the personnel sailed from Bordeaux for New York, May 12, 1919, on the *Panaman*; arrived in the United States on May 23, and were demobilized at Camp Meade, Md., May 30, 1919.

PERSONNEL

COMMANDING OFFICER

Col. Harold W. Jones, M. C., March 13, 1918, to July 5, 1918.

Lieut. Col. George A. Craigin, M. C., July 6, 1918, to August 16, 1918.

Lieut. Col. J. A. Talbott, M. C., August 17, 1918, to May 30, 1919.

CHIEF OF SURGICAL SERVICE

Capt. Bert G. Cholett, M. C.

Capt. Robert D. Schreck, M. C.

Maj. Wallace Cole, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. George A. Craigin, M. C.

BASE HOSPITAL NO. 115 °

Base Hospital No. 115 was organized in June, 1918, at Camp May, N. J., from officers and enlisted men of the Army at large. When organized, this hospital was designated as a special head hospital, and its staff and equipment were selected with that point in view. The mobilization of the unit was completed during July, 1918, at the General Hospital No. 11, at Camp May, N. J. On August 5 the command proceeded to Camp Upton, Long Island, N. Y.; completed its overseas equipment; embarked August 15 on the *Missenabie*; left New York Harbor August 15; arrived at Liverpool, England, August 28;

° The statements of fact appearing herein are based on the "History, Base Hospital No. 115, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

entrained the same day for Brookwood, England; arrived the following day; remained encamped for four days; proceeded by rail to Southampton on September 1; crossed the English Channel the same night; landed at Cherbourg, France, September 2. On the following morning the organization left Cherbourg for Vichy, Department of Allier, intermediate section, and arrived on September 6. This was the third hospital unit to reach Vichy, where it functioned as a part of the hospital center. It was assigned to the Hotel Ruhl, a large concrete building nine stories high, with a capacity of 1,657 beds. This building had been operated by Base Hospital No. 1, and when taken over, on September 11, contained 822 patients. Later the capacity of the hospital was increased to 2,963 beds.

This hospital did not function as a special head hospital for which it was intended but received a large majority of the head cases coming to the center. During its period of activity, September 11, 1918, to February 12, 1919, 6,962 medical and surgical cases were admitted. The largest number of patients in hospital at one time was 2,778, on November 17, 1918; the greatest number of officer patients at one time was 240.

Base Hospital No. 115 ceased to function February 12, 1919, and sailed from St. Nazaire on the *Mercury* April 19, 1919; arrived at New York April 30; and the entire organization was demobilized at Camp Dix, N. J., by May 10, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Edward C. Ellett, M. C., June 28, 1918, to May 10, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Norval H. Pierce, M. C.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Daniel J. McCarthy, M. C.

Maj. Henry B. Doust, M. C.

BASE HOSPITAL NO. 116^a

Base Hospital No. 116 was organized, December 20, 1917, at the Seventy-first Regiment Armory, New York City, from officers and enlisted men of the Army at large. The unit was under training at the armory until March 25, 1918, when it sailed from New York on the *Mauretania*; arrived at Liverpool, England, April 3; immediately proceeded by rail to Southampton; crossed the English Channel on the night of April 5; landed at Le Havre, France, April 6; entrained at Le Havre April 7 for Bazoilles-sur-Meuse, Department Vosges, in the advance section; arrived April 9. It was the third hospital unit to arrive at Bazoilles, where it functioned as an independent hospital until July 1; after July 1, 1918, it formed a part of the hospital center. It was assigned to a set of type A barracks, which were only partially complete, and had a crisis expansion in marquee tents, making a total capacity of 2,000 beds.

^a The statements of fact appearing herein are based on the "History, Base Hospital No. 116, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

The first patient was received June 2, 1918; during its period of active service the hospital cared for 5,837 medical and 6,603 surgical cases, with 1,259 operations. This hospital was designated as a special hospital for ear, nose, and throat and fracture cases in the hospital center. On July 20, 1918, Base Hospital No. 116 began to operate a neuropsychiatric department. This department functioned in a plant consisting of six wooden barracks, operated its own mess, and had its own specially trained personnel. During its service with Base Hospital No. 116 it admitted 1,048 cases, the majority of which were evacuated to the United States through Base Hospital No. 8 at Savenay.

On January 29, 1919, Base Hospital No. 116 ceased operating and turned over its patients and plant to Base Hospital No. 79. The personnel left the Bazoilles hospital center on March 19, 1919, and sailed from St. Nazaire March 28, 1919, on the *Turrialba*; arrived at Hoboken, N. J., April 13, 1919, and were demobilized shortly afterward.

PERSONNEL

COMMANDING OFFICER

Col. John W. Hanner, M. C., December 19, 1917, to June 27, 1918.

Lieut. Col. John B. Walker, M. C., June 28, 1918, to January 16, 1919.

Lieut. Col. Michael J. Thornton, M. C., January 17, 1919, to February 20, 1919.

Maj. Carlton W. Russell, M. C., February 21, 1919, to demobilization.

CHIEF OF SURGICAL SERVICE

Lieut. Col. John B. Walker, M. C.

Maj. Torr W. Harmer, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Theodore J. Abbott, M. C.

Capt. Frederic A. Alling, M. C.

BASE HOSPITAL NO. 117[†]

Base Hospital No. 117 was organized in March, 1918, at Camp Crane, Pa., from officers and enlisted men of the Army at large. This unit was intended to serve as a neuropsychiatric hospital and was composed of officers, enlisted men, and nurses who had had previous experience with mental and nervous diseases. The unit was trained at Camp Crane until May 17, 1918, when it proceeded by rail to the port of embarkation; arrived at Hoboken, N. J., on the following day; embarked on the *Saxon* and left port May 19, 1918, for Liverpool, England; arrived May 31; entrained the same day for the rest camp at Romsey, England; arrived June 1 and remained until June 7; marched to Southampton; crossed the English Channel the same night; landed in Le Havre, France, June 8. On June 9, the command left Le Havre for Savenay, Department Loire Inferieure; arrived June 11; proceeded to its permanent station at La Fauche, Department of Haute Marne, advance section, June 15; arrived, June 16.

[†] The statements of fact appearing herein are based on the "History, Base Hospital No. 117, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

At La Fauche the hospital occupied 22 100-foot barracks, with a total bed capacity of 350. This plant was being operated by a detachment of 4 officers and 10 enlisted men who were amalgamated with the personnel of Base Hospital No. 117. Later, the capacity of the hospital was increased by the erection of additional barracks, so that at the conclusion of the war, the hospital had a capacity of 1,000 beds. It also had a convalescent camp, located about half a mile from the hospital, consisting of four buildings, three of which were used as dormitories and one as a mess hall and kitchen. A small and very attractive farm was leased for the accommodation of sick officers.

Base Hospital No. 117 was not a part of any hospital center; it functioned independently and admitted neuropsychiatric cases only. During its existence, 3,268 patients were admitted; of these 295 were nonpsychoneurotic cases, having been received through error; of the remaining number, about 91 per cent were returned to duty (classes A, B, and C).

Base Hospital No. 117 ceased to function January 12, 1919; its personnel were reassigned to various hospitals for duty and the hospital plant at La Fauche was abandoned, January 31, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Clarence R. Bell, M. C., March 4, 1918, to September 4, 1918.

Lieut. Col. Frederick W. Parson, M. C., September 5, 1918, to January 26, 1919.

Maj. Walter J. Otis, M. C., January 27, 1919, to January 31, 1919.

CHIEF OF SERVICE

Maj. Sidney I. Schwab, M. C.

Capt. Douglas A. Thom, M. C.

BASE HOSPITAL NO. 118ⁱ

Base Hospital No. 118 was organized in September, 1918, at Camp Zachary Taylor, Ky., from officers and enlisted men of the Army at large. The unit was in training at Camp Taylor until November 3, when it entrained for Camp Mills, Long Island, N. Y.; sailed from New York November 13, 1918, on the *Cedric* for Liverpool, England; arrived November 24. On November 30, 1918, the organization arrived at Savenay, Department Loire Inferieure, base section No. 1, France. It was the seventh hospital unit to arrive at Savenay, where it functioned as part of the hospital center.

The personnel of this hospital assisted other units in the center from the date of arrival until January 21, 1919, when it was reassembled and began to function as a hospital for contagious diseases. It took over the buildings formerly occupied by Base Hospital No. 214, consisting of 11 frame and 4 cement buildings and 6 large tents. On January 27, it assumed charge of the tuberculosis camp, formerly operated by Base Hospital No. 8. This camp

ⁱ The statements of fact appearing herein are based on the "History, Base Hospital No. 118, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

consisted of 13 hollow-tile buildings. The distance between these two hospitals was about 1 km., which necessitated the operation of separate messes and receiving wards.

During its active service the contagious disease section admitted 1,111, and the tuberculosis section 1,940 patients.

Base Hospital No. 118 ceased to function June 23, 1919, and the personnel returned to the United States; sailed from St. Nazaire, July 6, 1919, on the *Matsonia*; arrived in the United States, July 16, and were demobilized at Camp Zachary Taylor, Ky., shortly afterward.

PERSONNEL

COMMANDING OFFICER

Capt. Thomas R. Payne, M. C., September 13, 1918, to March 23, 1919.
Lieut. Col. Thomas W. Burnett, M. C., March 24, 1919, to demobilization.

CHIEF OF SURGICAL SERVICE

Capt. William H. Carter, M. C.

CHIEF OF MEDICAL SERVICE

Capt. Erle O. Daniels, M. C.

BASE HOSPITAL NO. 119*

Base Hospital No. 119 was organized in September, 1918, at Camp Zachary Taylor, Ky., from officers and enlisted men of the Army at large. The unit was attached to the base hospital of that camp for instructions and temporary duty. The organization left Camp Taylor October 26, for Camp Upton, N. Y.; arrived October 28; remained until October 30; proceeded to Hoboken, N. J.; embarked the same day on the *Great Northern*; sailed October 31 for Europe; arrived at Brest, France, November 9; marched to the rest camp at Pontanezen Barracks; remained until November 13; entrained at Brest for its permanent station at Savenay, Department Loire Inferieure, base section No. 1; arrived, November 14. This was the fourth hospital unit to arrive at that station, where it functioned as a part of the hospital center. The organization was assigned to unit No. 5, a type A, 1,000-bed hospital, already in operation as an auxiliary to Base Hospital No. 8.

For a short period the administration continued to be under Base Hospital No. 8, but professional duties were at once taken over by the personnel of Base Hospital No. 119, and in December, 1918, it also took over the records and administration.

Since its facilities were not such as would permit giving proper care to patients critically ill, this hospital functioned chiefly as a receiving and evacuating hospital for patients sufficiently convalescent to be classed as walking cases.

During its active service as a hospital it cared for 10,467 medical and surgical cases.

* The statements of fact appearing herein are based on the "History, Base Hospital No. 119, A. E. F.," by Lieut. Col. Leeson O. Tarleton, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

Base Hospital No. 119 ceased to function June 22, 1919; its personnel sailed from St. Nazaire on the *Matsonia* July 6, 1919; arrived in the United States July 16, and were demobilized at Camp Zachary Taylor, Ky., on July 21, 1919.

PERSONNEL

COMMANDING OFFICER

Maj. William M. Chowning, M. C., September 1, 1918, to December 6, 1918.

Lieut. Col. Leeson O. Tarleton, M. C., December 7, 1918, to July 21, 1919.

CHIEF OF SURGICAL SERVICE

Capt. Francis M. Gorman, M. C.

Maj. William S. Titus, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Charles McC. Iseman, M. C.

Capt. Richard I. Dorge, M. C.

BASE HOSPITAL NO. 120¹

Base Hospital No. 120 was organized at Camp Greenleaf, Ga., on August 28, 1918, from officers and enlisted men of the Army at large. On September 10, 1918, the unit received orders to proceed to Camp Beauregard, La., and arrived at that station on September 12, 1918. On November 1, 1918, the unit left Camp Beauregard for Camp Upton, N. Y.; arrived November 5, 1918; remained until November 10; embarked on the *Empress of Russia*; sailed for Brest, France, November 12; arrived November 22; remained at the rest camp Pontanezen Barracks until December 10, 1918; proceeded to hospital center, Kerhuon, where it functioned under Base Hospital No. 65 until January 10, 1919.

On January 10, 1919, orders were received transferring the unit to Tours, at which station it arrived on January 15, 1919, and relieved Base Hospital No. 7, that organization being scheduled for return to the United States.

Base Hospital No. 120 continued to function at the hospital center, Joueles-Tours, until June 10, 1919, when it ceased operating. On June 28, it sailed from St. Nazaire on the *Marica*; arrived in the United States on July 9, 1919. The unit remained at Camp Merritt, N. J., until July 13, 1919, on which date it was transferred to Camp Dodge, Iowa, where it was demobilized July 16, 1919.

PERSONNEL

COMMANDING OFFICERS

Maj. William J. McManus, M. C., August 28, 1918, to February 12, 1919.

Col. Edward W. Pinkham, M. C., February 13, 1919, to July 16, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Dalbert E. Hoover, M. C.

¹ The statements of fact appearing herein are based on the "History, Base Hospital No. 120, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

CHIEF OF MEDICAL SERVICE

Lieut. Col. Harry M. Lee, M. C.

Maj. Charles W. Knapp, M. C.

Lieut. Col. Rogers S. Morris, M. C.

BASE HOSPITAL NO. 121 ^m

Base Hospital No. 121 was organized in August, 1918, at Camp Beauregard, La., from officers and enlisted men of the Army at large. The organization trained at Camp Beauregard until October 29, when it proceeded by rail to Camp Upton, N. Y., and arrived November 2, 1918. At Camp Upton, the unit remained for 10 days, completing its overseas equipment, and on November 12 it embarked on the *Adriatic*, leaving the following day, November 13, for Europe. It arrived at Liverpool, England, November 24; immediately proceeded by rail to Winchester and thence to Southampton; arrived November 25; crossed the English Channel the same night and landed at Le Havre, France, November 26. On November 27, the unit entrained for its permanent station, the hospital center at Beau Desert, Department of Gironde, base section No. 2, where it arrived November 29. Base Hospital No. 121 was the sixth hospital unit to arrive at the Beau Desert hospital center, where it took over a type A, 1,000-bed hospital. The hospital did not receive patients until January 24, 1919, and up to March 31, 1919, a total of 2,629 medical and surgical cases had been admitted.

Base Hospital No. 121 ceased to function as a hospital June 21, 1919, and its personnel proceeded on June 24, 1919, to Bordeaux for transportation to the United States; sailed from Bordeaux June 29, 1919, on the *Huron*; arrived in the United States July 11, and were demobilized at Camp Dodge, Iowa, July 17, 1919.

PERSONNEL

COMMANDING OFFICER

Maj. Orville T. Rogers, M. C., August 22, 1918, to December 7, 1918.

Maj. Jule B. Frankenheimer, M. C., December 8, 1918, to February 6, 1919.

Lieut. Col. Otho A. Fiedler, M. C., February 7, 1919, to April 21, 1919.

Lieut. Col. Maj. Charles A. E. Codman, M. C., April 22, 1919, to July 17, 1919.

CHIEF OF SURGICAL SERVICE

Capt. Irwin W. Ditton, M. C.

CHIEF OF MEDICAL SERVICE

Maj. George W. Scupham, M. C.

BASE HOSPITAL NO. 123 ⁿ

Base Hospital No. 123 was organized September 5, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large, and was transferred September 9, 1918, to Camp Greene, N. C. The organization remained

^m The statements of fact appearing herein are based on the "History, Base Hospital No. 121, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

ⁿ The statements of fact appearing herein are based on the "History, Base Hospital No. 123, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

in training at Camp Greene until October 28, on which date it left for Camp Mills, N. Y., arriving October 30. At Camp Mills the unit completed its overseas equipment; sailed from New York on the *Adriatic* for Europe, November 13; arrived at Liverpool, England, November 24; immediately entrained for Southampton; arrived on the following day; crossed the English Channel the same night; landed at Le Havre, France, November 26. After three days' rest at the Le Havre rest camp, the command proceeded by rail to its final destination, Mars-sur-Allier, Department of Nièvre, in the intermediate section; arrived, December 2. This was the eighth hospital unit to reach Mars, where it functioned as a part of that hospital center. On December 5, the organization took over a type A, 1,000-bed hospital, which had been operated as an annex to Base Hospital No. 68, and which contained about 1,200 patients; these patients consisted mostly of classified (A and B) casualties from Base Hospital No. 68.

The hospital, taken over from Base Hospital No. 68, was not very well equipped, and on February 5, 1919, Base Hospital No. 123 took over the patients and the plant of Evacuation Hospital No. 30, which was a well-appointed hospital, having a thoroughly equipped operating room and X-ray apparatus.

Base Hospital No. 123 ceased to function April 20, 1919, and its personnel sailed from St. Nazaire June 23, 1919, on the *Arizonan*; arrived in the United States July 6, and were demobilized at Camp Pike, Ark., July 15, 1919.

PERSONNEL

COMMANDING OFFICER

Maj. Carlyle E. Sutphen, M. C., September, 1918, to July 15, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Thomas B. Carroll, M. C.

CHIEF OF MEDICAL SERVICE

Maj. August G. Wichman, M. C.

BASE HOSPITAL NO. 131 °

Base Hospital No. 131 was organized July 23, 1918, at Jefferson Barracks Mo., from officers and enlisted men of the Army at large. The organization trained at that station until September 25, when it entrained for Camp Upton, N. Y., where it arrived September 28. On account of the influenza epidemic, the unit was detained at Camp Upton for two weeks; sailed on the *Ortega*, October 13; arrived at Liverpool, England, October 24; entrained immediately for Winchester, England; arrived the following day. On October 26, the command proceeded by rail to Southampton; crossed the English Channel the same night, landed at Cherbourg, France, October 27; remained at the Cherbourg rest camp for five days; entrained for its permanent station, the hospital center at Mars-sur-Allier, Department of Nièvre, in the inter-

° The statements of fact appearing herein are based on the "History, Base Hospital No. 131, A. E. F.," by Lieut. Col. H. H. Smith, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

mediate section, October 31; arrived November 3, 1918. It was the sixth hospital unit to reach Mars, where it functioned as a part of the hospital center. It was assigned to a type A, 1,000-bed hospital, and began to receive patients on November 18.

On January 15, 1919, the unit took over the patients and the plant of Base Hospital No. 14, of the same center, moving its own patients and offices to the new location. On January 20, the patients and equipment of Base Hospital No. 68 were taken over. At this time the hospital contained the largest number of patients, 1,034. During its period of activity, November 18, 1918, to April 10, 1919, 3,048 surgical and medical cases were admitted.

Base Hospital No. 131 ceased to function as a hospital on April 10, 1919, and its personnel sailed from Brest for New York, May 23, 1919, on the *Fred-erick*; arrived in the United States, June 2, and were demobilized at Camp Taylor, Ky., shortly afterwards.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Hubert H. Smith, M. C., July 23, 1918, to April 10, 1919.

CHIEF OF SURGICAL SERVICE

Lieut. Col. Daniel F. Jones, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Duncan B. McEachern, M. C.

BASE HOSPITAL NO. 136 ^v

Base Hospital No. 136 was organized in September, 1918, at Camp Greenleaf, Ga., from officers and enlisted men of the Army at large. On September 10, 1918, the unit was transferred to Camp Wheeler, Ga., where it trained until October 18, when it left for Camp Merritt, N. J., arriving there October 20. On October 25, it moved to Camp Upton, N. Y.; remained there until November 15, 1918; sailed on that date from New York on the *La France*; arrived at Brest, France, November 22; marched to the rest camp at Pontanzen Barracks; remained for one week and then proceeded by rail to its final destination, the hospital center at Vannes, Department Morbihan, base section No. 5; arrived December 1, 1918. It was the second hospital unit to arrive at that station, where it functioned as a part of a small two-unit hospital center. At Vannes, the unit was assigned to the Caserne Quartier Senarmont, formerly occupied by the French Thirty-fifth Field Artillery. These barracks consisted of three large four-story buildings, kitchens, guard-house, stables, and several other buildings surrounded by a wall, forming an inclosure 760 by 860 feet.

The hospital received its first patients on December 16, 1918; during its active service it cared for approximately 3,000 surgical and medical cases.

^v The statements of fact appearing herein are based on the "History, Base Hospital No. 136, A. E. F.," by Lieut. Col. Howard Fox, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

The bed capacity of the hospital was 2,300; the largest number of patients in hospital at one time was 1,558, on February 8, 1919; this included patients in an annex at Carnac.

On January 18, 1919, Base Hospital No. 136 took over patients and the plant of Base Hospital No. 236, which was located at Carnac, and whose personnel were amalgamated with Base Hospital No. 136.

Base Hospital No. 136 ceased to function as a hospital on June 9, 1919, and its personnel sailed from St. Nazaire for New York July 8, 1919, on the *Manchuria*; arrived in the United States, July 18, and were demobilized at Camp Upton, N. Y., July 24, 1919.

PERSONNEL

COMMANDING OFFICER

Capt. Francis L. Quigley, M. C., September 10, 1918, to November 8, 1918.

Lieut. Col. Howard Fox, M. C., November 9, 1918, to July 24, 1919.

CHIEF OF SURGICAL SERVICE

Capt. Francis R. Haussling, M. C.

CHIEF OF MEDICAL SERVICE

Capt. Mark Millikin, M. C.

Capt. Francis L. Quigley, M. C.

BASE HOSPITAL NO. 202 ^a

Base Hospital No. 202 was organized in France, in June, 1918, from officers and enlisted men of the American Expeditionary Forces at large. At this time it was known as Hospital A; later, in July, 1918, it was officially designated as Base Hospital No. 202. The nucleus of the personnel was taken from replacement unit A, which arrived at Blois, France, June 12, 1918. Base Hospital No. 202 was situated at Orleans, France, Department Loriet, in the intermediate section. This hospital operated in an excellent plant, consisting of several schools and barracks, all of which were well adapted for hospital purposes. All of the buildings were electrically lighted, some were steam heated; water was supplied in abundance.

The normal bed capacity on November 11, 1918, was 2,800, with provisions for expansion to 6,000 beds. During its period of activity, July 17, 1918, to February 17, 1919, the hospital cared for 3,127 medical cases and 2,717 surgical cases, with 887 operations. It was our only hospital unit at Orleans and functioned independently.

Base Hospital No. 202 ceased to function on February 17, 1919, when it was officially closed, all remaining patients having been transferred to other hospitals on February 16, 1918. On March 16, 1919, the organization proceeded to Brest; sailed April 7, on the *Graf Waldersee*; arrived at Hoboken, N. J., April 20, and was demobilized at Camp Dix, N. J., April 27, 1919.

^a The statements of fact appearing herein are based on the "History, Base Hospital No. 202, A. E. F.," by Lieut. Col. William H. Bishop, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. William H. Bishop, M. C., June, 1918, to April 27, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Lonnie W. Grove, M. C.

CHIEF OF MEDICAL SERVICE

Maj. J. H. Lawson, M. C.

BASE HOSPITAL NO. 204^r

Base Hospital No. 204 came into existence September 30, 1918, when the United States Military Hospital, Hursley Park, near Winchester, England, which had been operating since April 20, 1918, was designated by the chief surgeon of the American Expeditionary Forces as Base Hospital No. 204. This hospital, when it was started on April 20, 1918, by the hospital unit I, consisted of a group of 8 wards, each capable of accommodating 33 patients. These wards together with a few smaller outlying isolation wards and other buildings, were later known as the A group. The main group of wards, roofed and sided with galvanized iron, were connected with each other and with the administration building by corridors. Similarly constructed huts provided quarters, mess halls, and kitchens for the staff and nurses. The total bed capacity was 360; 30 beds of this number were reserved for British patients.

On September 30, definite plans were adopted for the enlargement of this institution; existing buildings were to be adapted as wards, kitchens, and personnel quarters; 16 new wards and nurses' quarters were under construction when the work was stopped by the signing of the armistice.

The bed capacity of the hospital when completed was to be 2,000, with additional 700 emergency beds. The total number of patients admitted during the existence of the hospital, April 20, 1918, to December 24, 1918, was 3,678. The greatest number of patients in the hospital at one time was 937, on November 15, 1918.

Base Hospital No. 204 was officially closed December 24, 1918, all of its patients being transferred to other hospitals in England. Prior to that date the personnel were reassigned for duty with various organizations in the American Expeditionary Forces.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. William J. Mixter, M. C., September 30, 1918, to December 24, 1918.

CHIEF OF SURGICAL SERVICE

Maj. Thomas M. Jones, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Fred R. Jouett, M. C.

^r The statements of fact appearing herein are based on the "History, Base Hospital No. 204, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

BASE HOSPITAL NO. 208 *

Base Hospital No. 208 came into existence on November 1, 1918, when Camp Hospital No. 47, located at Autun, Soane et Loire, was officially designated Base Hospital No. 208. The hospital was located in a large three-story stone building, which before the war had been a school, and during the war, prior to its occupation by the United States, had been used by the French as a temporary hospital. The building was first taken over by the United States in June, 1918, but did not function as a hospital until the first week in August, when Base Hospital No. 45 arrived and took possession. This unit remained only a short time and was then transferred elsewhere. On September 24 a medical officer and 50 enlisted men arrived and began functioning as Camp Hospital No. 47. On November 1, 1918, Camp Hospital No. 47 became Base Hospital No. 208, functioning as such until the middle of December, 1918, when all patients were evacuated, the property was returned to the medical supply depot, and on December 31, 1918, the entire personnel left Autun for Bordeaux to take over Base Hospital No. 6.

The organization arrived at Bordeaux on January 2, 1919, and on January 15 took over all patients, property, and records of Base Hospital No. 6. During its existence, Base Hospital No. 208 evacuated a total of 6,575 cases, of which 4,950 were ambulatory, without dressing. Base Hospital No. 208 ceased to function June 1, 1919, and its personnel sailed on the *Alphonso* for the United States on June 13; arrived in the United States June 24, 1919; and were demobilized on June 27, 1919.

PERSONNEL**COMMANDING OFFICER**

Lieut. Col. Gustavus M. Blech, M. C., November 1, 1918, to June 1, 1919.

CHIEF OF SURGICAL SERVICE

Capt. Raymond M. Spivy, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Franklin A. Martin, M. C.

BASE HOSPITAL NO. 210 †

Base Hospital No. 210 was organized November 1, 1918, at Toul, Department of Meurthe-et-Moselle, in the advance section, where it functioned as a convalescent hospital for the Toul hospital center. The personnel comprised officers and enlisted men taken from various organizations on duty at that center. A majority of the enlisted men were class A and B patients assigned from other hospitals of the group.

The hospital was located in the Caserne Marechal Ney, which consisted of an 8-acre parade ground in a rectangle, around which three large 4-story buildings, two 2-story buildings and three 1-story mess halls were grouped;

* The statements of fact appearing herein are based on the "History, Base Hospital No. 208, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

† The statements of fact appearing herein are based on the "History, Base Hospital No. 210, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

the total bed capacity was 3,500. The buildings when taken over were in a very insanitary condition and required many repairs, but were well suited for a hospital. The institution was opened for patients November 4, 1918. On April 1, 1919, Base Hospital No. 210 ceased to function as a convalescent hospital and took over the patients and quarters of Base Hospital No. 78, the latter organization being under orders to return to the United States.

Base Hospital No. 210 operated as a hospital from April 1 to 27, when it was closed and prepared for return to the United States. During its service as a convalescent hospital, November 4, 1918, to March 31, 1919, it handled 5,845 patients. It was ordered to return to the United States, June 9, 1919; sailed on that date from Brest on the *New Amsterdam* for New York; arrived June 19; and was demobilized at the Presidio of San Francisco, Calif., on June 30, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Bertram F. Alden, M. C., November 1, 1918, to December 23, 1918.

Maj. Francis G. Aud, M. C., December 24, 1918, to June 30, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Francis G. Aud, M. C.

CHIEF OF MEDICAL SERVICE

Capt. Thomas G. Miller, M. C.

BASE HOSPITAL NO. 214 *

Base Hospital No. 214 came into existence November 6, 1918, at Savenay, Department Loire Inferieure, in the base section No. 1, when the neuropsychiatric service of Base Hospital No. 8 was organized into an independent unit, and designated Base Hospital No. 214. This hospital functioned as a special hospital for mental and neurological patients and occupied a plant consisting of 10 wooden, knock-down type of barracks. In January, 1919, when the admission rate increased, the unit was assigned to a type A, 1,000-bed hospital, the construction of which was not completed; and as special construction was necessary, this was done chiefly by the patients.

The personnel of the institution changed a great deal, as it furnished officers and enlisted men to supervise transportation of convoys of patients to the United States, and exercised supervision until patients were delivered to their destination there. The convoys consisted as a rule of from 50 to 200 cases, occasionally more. From November 1, 1918, to February 28, 1919, this hospital admitted 6,093 cases; the greatest number treated at one time was 700, including 40 officers.

Base Hospital No. 214 ceased to function June 21, 1919, and the personnel returned to the United States on the *Scranton*; sailed from St. Nazaire for New York July 6, 1919; arrived July 16, and were demobilized at Camp Dix, N. J., July 22, 1919.

* The statements of fact appearing herein are based on the "History, Base Hospital No. 214, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Sanger Brown, M. C., November 6, 1918, to March 20, 1919.
Lieut. Col. Jesse M. W. Scott, M. C., March 21, 1919, to July 22, 1919.

CHIEF OF THE SERVICES

Maj. Joseph B. Betts, M. C.
Maj. Charles D. Humes, M. C.
Lieut. Col. Sanger Brown, M. C.
Maj. J. J. Hughes, M. C.
Maj. Arthur H. Ruggles, M. C.
Maj. Henry M. Swift, M. C.
Maj. Joseph W. Moore, M. C.

BASE HOSPITAL NO. 216 *

Base Hospital No. 216 was organized November 1, 1918, at the Nantes hospital center, Department Loire Inferieure, base section No. 1. The personnel were taken from base hospitals stationed within the center. The unit was assigned to a standard type A, 1,000-bed hospital of cement, fiber construction, with an emergency expansion to 1,800 beds. When taken over, it contained about 1,200 patients, the overflow from Base Hospitals Nos. 11 and 38. The hospital handled chiefly medical cases. The greatest number of patients in the hospital at one time was 1,514 on November 7, 1918.

In addition to its formal functions, the hospital was designated a special hospital for all communicable diseases and all complicated cases of venereal disease of the center; the latter service admitted a total of 590 cases. Base Hospital No. 216 also functioned as a camp infirmary for the personnel of the entire hospital center. In January, 1919, the hospital was designated as the evacuation hospital for the center, and all patients evacuated directly to the United States were sent through this unit. A total of 6,367 patients were handled by the evacuation department.

Base Hospital No. 216 ceased to function on June 21, 1919, and its personnel returned to the United States; sailed from St. Nazaire, July 6, 1919, on the *Matsonia*; arrived in the United States July 16, and were demobilized at Camp Dix, N. J., July 21, 1919.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. Robert B. Pratt, M. C., November 1, 1918, to July 21, 1919.

CHIEF OF SURGICAL SERVICE

Maj. John F. Park, M. C.

CHIEF OF MEDICAL SERVICE

Maj. Henry H. Kleinpell, M. C.

* The statements of fact appearing herein are based on the "History, Base Hospital No. 216, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

BASE HOSPITAL NO. 218 ^w

Base Hospital No. 218 came into existence November 5, 1918, at Poitiers, France, Department of Vienne, intermediate section, when Camp Hospital No. 61 was designated Base Hospital No. 218. The hospital was located in the following buildings: The Ancienne Séminaire, bed capacity 400, used largely for surgical cases; the École de Théologie, bed capacity 325, used for medical cases; part of the University of Poitiers, bed capacity 250; and the Caserne d'Abbeville with bed capacity of 1,000. The total capacity of the hospital was 2,000 beds. During its activity as a base hospital it cared for 1,114 surgical and medical cases.

Base Hospital No. 218 was not a part of any hospital center and operated independently. This organization functioned as a base hospital for only three months, and on February 13, 1919, it reverted to its former status, that of Camp Hospital No. 61. The majority of the personnel, including the commanding officer, were reassigned to Camp Hospital No. 61 for duty, and Base Hospital No. 218 ceased to exist February 13, 1919.

PERSONNEL**COMMANDING OFFICER**

Maj. Ernest L. Bell, M. C., November 5, 1918, to February 13, 1919.

CHIEF OF SURGICAL SERVICE

Capt. John W. McGuire, M. C.

CHIEF OF MEDICAL SERVICE

Capt. John P. Howser, M. C.

BASE HOSPITAL NO. 236:^z

Base Hospital No. 236 came into existence November 18, 1918, at Carnac and Quiberon, Department Morbihan, in base section No. 1, when Camp Hospital No. 92 was designated Base Hospital No. 236. This hospital functioned only a short time as a base hospital and was a part of the Vannes hospital center. It operated in the towns of Carnac, Quiberon, and Plouharnel, with a total bed capacity of 1,000. At Carnac the unit occupied 1 hotel and 5 villas, which were well suited for hospital purposes, and had a capacity of 200 beds. At Quiberon it occupied 12 small summer hotels and villas, scattered over the town, only 2 of which held more than 100 beds. The hospitalization at Quiberon was extremely difficult and unsatisfactory; there were neither heat, light, nor bathing facilities. The patients were scattered all over the town, were hard to control, and discipline was bad. The distance to the hospital center at Vannes was 30 miles and to Carnac 10 miles; this made it very difficult to supply and control the hospital. The unit functioned only two months and during that time cared for 1,131 surgical and medical cases.

^w The statements of fact appearing herein are based on the "History, Base Hospital No. 218, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^z The statements of fact appearing herein are based on the "History, Base Hospital No. 236, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

On January 18, 1919, Base Hospital No. 236 was dissolved and its personnel were transferred to Base Hospital No. 136 at Vannes. The buildings at Carnac and Plouharnel were taken over and operated by Base Hospital No. 136.

PERSONNEL

COMMANDING OFFICER

Lieut. Col. William E. Butler, M. C., November 18, 1918, to January 18, 1919.

CHIEF OF THE SERVICES

Capt. N. Worth Brown, M. C.



FIG. 147.—Base Hospital No. 236, Carnac

BASE HOSPITAL NO. 238 ^v

Base Hospital No. 238 was organized November 20, 1918, at Rimaucourt, Department Haute Marne, in the advance section, and its personnel were drawn from Base Hospitals Nos. 52, 58, 59, and 64, already stationed in that center. This was the fifth base hospital to join the Rimaucourt hospital center, where it occupied a type A, 1,000-bed hospital. It was designated as a special hospital for eye, ear, nose, and throat, skin and genitourinary diseases, and contained the central laboratory and morgue. It also maintained an outdoor clinic in all of its departments, and many patients from the surrounding area, as well as from other hospitals of the center, were treated as ambulatory cases.

^v The statements of fact appearing herein are based on the "History, Base Hospital No. 238, A. E. F.," by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

Whenever surgical, medical, or dental cases were found in the hospital, they were transferred, upon the advice of the chief of the service concerned, to another hospital.

Base Hospital No. 238 existed less than three months and during that time cared for 802 patients. The unit ceased operating on January 26, 1919, and was disbanded at Rimaucourt on February 15, 1919, and Base Hospital No. 238, the last base hospital to be organized in the World War, ceased to exist.

PERSONNEL

COMMANDING OFFICER

Capt. Robert E. Hale, M. C., November 20, 1918, to December 25, 1918.

Lieut. Col. Sidney J. Meyers, M. C., December 26, 1918, to February 15, 1919.

CHIEF OF SURGICAL SERVICE

Maj. Edmund R. Brush, M. C.

CHIEF OF MEDICAL SERVICE

Maj. John J. Madigan, M. C.

CHAPTER XXV

CAMP HOSPITALS ^a

CAMP HOSPITAL NO. 1 ^b

Camp Hospital No. 1 was established in July, 1917, at Gondrecourt, Department Meuse, in the advance section, by Field Hospital No. 13. It was located in temporary wooden barracks, of French construction, with a bed capacity of 300, and it served the first training area. In the latter part of October, 1917, Field Hospital No. 13 was relieved by Field Hospital No. 12 which, in turn, was relieved on November 12, 1917, by Field Hospital No. 1. Field Hospital No. 3 relieved No. 1 in January, 1918, and Field Hospital No. 162 relieved the latter on April 7, 1918, and operated the hospital until July 18, 1918, when it was relieved by personnel permanently assigned. Camp Hospital No. 1 ceased to function May 12, 1919; all of its remaining patients on that date were transferred to Base Hospital No. 91, at Commercy. The personnel of the hospital sailed for New York from St. Nazaire, June 14, 1919, on the *Santa Barbara* and were demobilized June 28, 1919.

CAMP HOSPITAL NO. 2 ^c

Camp Hospital No. 2 was organized December 21, 1917, at Bassens, Department Gironde, base section No. 2. The hospital, when first organized, was located in two wards, Service de Santé type, of 60-bed capacity, and served rest camp No. 4, near Bordeaux. Additional buildings were constructed from time to time to accommodate the increasing number of patients, until, in February, 1919, the bed capacity of the hospital was 600. The hospital ceased functioning June 11, 1919. The detachment was skeletonized and sailed from Bordeaux on June 17, 1919, on the *Otsego*, and was demobilized at Camp Jackson, S. C., July 7, 1919.

CAMP HOSPITAL NO. 3 ^d

Camp Hospital No. 3 was established June 26, 1918, at Bourmont, Department Haute Marne, advance section. The personnel came from the American Expeditionary Forces at large, and consisted of 10 officers and 60 enlisted men. The hospital occupied a standard type B, 300-bed hospital and began to function July 4, 1918, with the arrival of the 37th Division. It served the

^a The numbers of the camp hospitals considered in this chapter do not form a complete series; that is to say, unless a camp hospital, which had been given a definite number, actually operated it has not been included herein.—*Ed.*

^b The statements of fact appearing herein are based on the "History, Camp Hospital No. 1, A. E. F.," Gondrecourt, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^c The statements of fact appearing herein are based on the "History, Camp Hospital No. 2, A. E. F.," Bassens, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^d The statements of fact appearing herein are based on the "History, Camp Hospital No. 3, A. E. F.," Bourmont, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

third training area, which at different times was occupied by the 37th, 42d, 78th, 82d, 29th, and 26th Divisions. During its active service, July 4, 1918, to March 26, 1919, the hospital received 2,332 medical and surgical cases. Camp Hospital No. 3 ceased to function March 26, 1919. The personnel sailed from Brest on the *President Grant* May 28, 1919, and were demobilized at Camp Devens, Mass., June 14, 1919.

CAMP HOSPITAL NO. 4 *

Camp Hospital No. 4, at Joinville le Pont, in the district of Paris, was established April 26, 1918, in a small group of old and dilapidated school buildings. At first there were neither modern plumbing nor sewer connections;



FIG. 148.—Camp Hospital No. 2, Bassens

no hot-water plant was available, and baths had to be prepared from water heated on small oil stoves. The bed capacity at first was 300, which later was increased to 800 by the erection of several wooden barracks. The hospital was operated by hospital unit C. Patients were received first on May 24, 1918; the first battle casualties arrived July 17, 1918, 100 wounded being in the convoy. The hospital continued to receive wounded until the armistice; the largest number received in one day was 450, on July 30, 1918. It also functioned as a post hospital for the district of Paris and received all the sick and venereal cases from our military prisons in Paris. The largest number of patients in hospital at one time was 825, on September 8, 1918. During its existence, the hospital received 9,800 patients, about 25 per cent of which

*The statements of fact appearing herein are based on the "History, Camp Hospital No. 4, A. E. F.," Joinville le Pont, by Lieut. Col. Samuel E. Lambert, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

were battle casualties. Camp Hospital No. 4 ceased to function on June 5, 1919, and its personnel (unit C) returned to the United States, sailing from St. Nazaire July 3, 1919, on the *Alaskan*, and was demobilized at Camp Sherman, Ohio, July 21, 1919.

CAMP HOSPITAL NO. 5¹

Camp Hospital No. 5 was established officially on February 27, 1918, at Genicart, Department Gironde, base section No. 2. Prior to that time this hospital was known as the Camp Infirmary and served rest camp No. 2, near Bordeaux. The hospital buildings were wooden barracks of French construc-



FIG. 149.—Camp Hospital No. 4, Joinville

tion and had a total bed capacity of 500. On November 24, 1918, rest camps Nos. 1 and 2 were consolidated into the "Bordeaux embarkation camp," and Camp Hospital No. 5 was designated as the entrance hospital of the camp. The hospital ceased to function June 12, 1919, and its personnel were skeletonized to 1 officer and 20 enlisted men, who sailed from Bordeaux for the United States July 1, 1919, and were demobilized at Camp Upton, N. Y., July 19, 1919.

¹ The statements of fact appearing herein are based on the "History, Camp Hospital No. 5, A. E. F.," Genicart, by Maj. H. B. Montgomery, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

CAMP HOSPITAL NO. 7^a

Camp Hospital No. 7 was organized June 3, 1918, at Humes, Department Haute Marne, advance section, and served the seventh training area. The hospital occupied a type B, 300-bed unit, with emergency expansion to 370. It was operated first by Evacuation Hospital No. 4 and later, in July, 1918, by Field Hospital No. 310. When the latter organization was sent to the front, the hospital was manned by personnel from the American Expeditionary Forces at large. Patients were received first on July 27, 1918. During its activity the hospital cared for 2,576 medical and 402 surgical cases. Camp Hospital No. 7 ceased to function on March 17, 1919, its remaining patients being then transferred to Base Hospital No. 53, at Langres.



FIG. 150.—A ward interior, Camp Hospital No. 7, Humes

CAMP HOSPITAL NO. 8^b

Camp Hospital No. 8 was established June 26, 1918, at Montigny-le-Roi, Department Haute Marne, advance section, its personnel being obtained from the American Expeditionary Forces at large. It occupied a standard type B, 300-bed unit, the construction of which had been completed when the organization arrived; however, it was only about 50 per cent equipped. Camp

^a The statements of fact appearing herein are based on the "History, Camp Hospital No. 7, A. E. F.," Humes, by Capt. J. P. McQuillin, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^b The statements of fact appearing herein are based on the "History, Camp Hospital No. 8, A. E. F.," Montigny-le-Roi, by Maj. Virgil E. Simpson, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

Hospital No. 8 served the eighth training area, which was occupied successively by the 83d, 91st, and 26th Divisions. During the influenza epidemic in November and December, 1918, Field Hospitals Nos. 101 and 103 were established on the hospital grounds and cared for the overflow of the camp hospital. During its activity the hospital cared for 3,020 medical and 331 surgical cases. On April 22, 1919, all remaining patients were transferred to Base Hospital No. 63, at Langres; Camp Hospital No. 8 ceased to function on that date. The detachment proceeded to Brest, whence it sailed for New York on June 10, 1919, on the *Agamemnon*, and was demobilized at Camp Sherman, Ohio, June 24, 1919.

CAMP HOSPITAL NO. 9¹

Camp Hospital No. 9 was established in June, 1918, at Chateau Villain, Department Haute Marne, advance section. Its personnel were mobilized at Blois from officers and enlisted men of the American Expeditionary Forces at large, and arrived at station June 25, 1918. The hospital occupied a standard type B, 300-bed unit, with emergency expansion to 400. Construction of the hospital had been completed prior to the arrival of the personnel; part of the equipment was on hand. This hospital served the ninth training area, and began to receive patients on June 26. During its active service it cared for 3,390 surgical and medical cases. On March 25, 1919, all remaining patients were transferred to other hospitals, and Camp Hospital No. 9 ceased to function. The personnel sailed for Newport News, Va., from Brest on the *Freedom*, May 25, 1919, and were disbanded at Camp Sherman, Ohio, June 17, 1919.

CAMP HOSPITAL NO. 10²

Camp Hospital No. 10 was established in April, 1918, at Prauthoy, Department Haute Marne, advance section, and began to operate April 20, 1918. It was a standard type B, 300-bed unit, with emergency expansion to 360; it served the tenth training area, which was successively occupied by the 32d, 29th, 79th, and 82d Divisions. During the months of April and May, 1918, the hospital was operated by the medical staff of the 32d Division and upon departure of that division was operated temporarily by Evacuation Hospital No. 5. On June 28, 1918, the permanent personnel of Camp Hospital No. 5 arrived, and took charge July 1, 1918. The hospital ceased to function on March 23, 1919, and its personnel was reassigned to other organizations for duty.

CAMP HOSPITAL NO. 11³

Camp Hospital No. 11 was established March 12, 1918, at St. Nazaire, base section No. 1. The personnel comprised Sanitary Squad No. 1 and Field Hospital No. 44. When first organized, the hospital occupied a standard

¹ The statements of fact appearing herein are based on the "History, Camp Hospital No. 9, A. E. F.," Chateau Villain, by Maj. Clarendon W. Brown, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

² The statements of fact appearing herein are based on the "History, Camp Hospital No. 10, A. E. F.," Prauthoy, by Maj. John W. Emhardt, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

³ The statements of fact appearing herein are based on the "History, Camp Hospital No. 11, A. E. F.," St. Nazaire, by Maj. Ward Brinton, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

type B, 300-bed unit, but later, when the activities of the port demanded more hospital facilities, necessary buildings were added. On July 31, 1918, a venereal segregation camp was established in connection with the hospital, and cared for all patients with venereal disease coming into that port. In April, 1919, the hospital comprised 38 wooden barracks, with a total bed capacity of 703. During its existence, this hospital cared for a total of 12,291 medical and surgical cases, including 5,085 cases of venereal disease. On June 18, 1919, it was designated Infirmary, St. Nazaire, and ceased to function as a camp hospital on that date. Its personnel, with exception of a skeletonized unit, were reassigned to duty with the infirmary. The skeletonized Camp Hospital No. 11, consisting of 1 officer and 4 enlisted men, sailed July 10, 1919, on the *Amphion*, from St. Nazaire, and was demobilized at Camp Sherman, Ohio, July 28, 1919.

CAMP HOSPITAL NO. 12¹

Camp Hospital No. 12 came into existence October 12, 1917, at Le Valda-hon, Department Doubs, advance section, when camp hospital, 1st Field Artillery Brigade, A. E. F., was redesignated Camp Hospital No. 12. It occupied a French military hospital, comprising three buildings of stone and several Service de Santé type huts, with a total normal bed capacity of 300. It served the fiftieth training area. During the influenza epidemic in September, 1918, the rate of admissions was so great that all vacant buildings in the camp, including the Y. M. C. A. hut, were utilized for hospital purposes. The greatest number of patients in hospital was on September 29, 1918, when 1,335 were being cared for. As the number of medical officers on duty was entirely inadequate, line officers were assigned by the brigade commander to assist in the administration of the hospital. Enlisted men of the line were used for fatigue, in kitchen, office, and, in many instances, in ward work. Camp Hospital No. 12 ceased to function on May 23, 1919; its personnel sailed on June 24, 1919, from Brest for New York on the *Huntington* and were demobilized at Camp Gordon, Ga., July 6, 1919.

CAMP HOSPITAL NO. 13^m

Camp Hospital No. 13 was established November 13, 1917, at Mailly, Department Aube, advance section, its personnel being obtained from the American Expeditionary Forces at large. The hospital occupied 17 Service de Santé type barracks, built for and occupied by the Russians in 1916. Its bed capacity was 450.

Camp Hospital No. 13 served our miscellaneous troops in the Mailly area; during its active service, November 13, 1917, to December 31, 1918, it cared for 5,656 medical and surgical cases. Camp Hospital No. 13 ceased to function December 31, 1918, the property was returned to the French, and the personnel assigned to other organizations for further duty.

¹ The statements of fact appearing herein are based on the "History, Camp Hospital No. 12, A. E. F.," Le Valda-hon, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington. D. C.—Ed.

^m The statements of fact appearing herein are based on the "History, Camp Hospital No. 13, A. E. F.," Mailley, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington. D. C.—Ed.

CAMP HOSPITAL NO. 14 ⁿ

Camp Hospital No. 14 was established October 15, 1917, at Issoudun, Department Indre, intermediate section, and served the third aviation instruction center. Personnel were obtained locally. When opened, the entire hospital was housed in one American Red Cross building, 25 by 60 feet, but later, when construction of the hospital had been completed, it consisted of 17 ward buildings, surgical building, quarters and messes for the personnel and had a normal bed capacity of 575.

During its existence this hospital cared for approximately 7,000 surgical and medical cases. Camp Hospital No. 14 ceased to function on April 15, 1919; its personnel sailed on May 25, 1919, from Bordeaux on the *Chicago*, and were demobilized at Camp Dodge, Iowa, June 17, 1919.

CAMP HOSPITAL NO. 15 ^o

Camp Hospital No. 15 was established in October, 1917, at Coetquidan, Department Ille et Vil, base section No. 1. Its personnel came from the American Expeditionary Forces at large. It occupied three large stone buildings, and several Adrian barracks, and had a total bed capacity of 900. The hospital served the Meucon Artillery training area and began to receive patients November 1, 1917. In September, 1918, a venereal segregation camp was established in connection with Camp Hospital No. 15. The greatest number of patients in hospital at one time was 900—in September, 1918. Camp Hospital No. 15 ceased to function June 30, 1919, and its personnel sailed from St. Nazaire for Newport News, Va., July 9, 1919, on the *Buford*, and were demobilized shortly afterward.

CAMP HOSPITAL NO. 19 ^p

Camp Hospital No. 19 was established December 23, 1917, at La Courtine, Department Creuse, base section No. 2. The personnel came from the American Expeditionary Forces at large. When first opened, the hospital functioned in three widely separated French buildings, in a training camp. At first its bed capacity was 140; later, when construction was completed, it comprised 8 buildings, with a normal bed capacity of 500. During its existence the hospital cared for 3,025 surgical and medical cases. Camp Hospital No. 19 ceased to function May 31, 1919; its personnel returned to the United States, sailing from Bordeaux, June 20, 1919, on the *Canandaigua*, and were demobilized at Camp Jackson, S. C., shortly afterward.

ⁿ The statements of fact appearing herein are based on the "History, Camp Hospital No. 14, A. E. F.," Issoudun, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^o The statements of fact appearing herein are based on the "History, Camp Hospital No. 15, A. E. F.," Coetquidan, by Maj. William L. Edmundson, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^p The statements of fact appearing herein are based on the "History, Camp Hospital No. 19, A. E. F.," La Courtine, by First Lieut. James H. MacDuffie, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

CAMP HOSPITAL NO. 20 ^a

Camp Hospital No. 20 was established November 11, 1917, at Camp de Souge, Department Gironde, base section No. 2. It functioned in barrack-type buildings, constructed by the United States Engineers, and had a bed capacity of 750. This hospital served the troops in Camp de Souge, the second aerial observation and balloon school, and several billeting areas. Camp Hospital No. 20 ceased to operate May 2, 1919, and its personnel were reassigned to other organizations for duty.

CAMP HOSPITAL NO. 21 ^r

Camp Hospital No. 21 was established February 8, 1918, at Bourbonnelles-Bains, Department Haute Marne, advance section. It served the eleventh training area, which was occupied successively by the 29th, 78th, 82d, 92d, Divisions, and the Sixth Army Corps. The hospital operated in a modern building, a hotel, which had been constructed at the beginning of the war. This building was of concrete and consisted of seven stories and a basement. There was an electric elevator connecting all floors. The normal bed capacity was 300. On April 10, 1918, hospital unit L arrived and took over Camp Hospital No. 21. During its existence, the hospital cared for 5,455 medical and surgical cases. It ceased to function April 25, 1919; unit L returned to the United States, sailing from Marseille, May 15, 1919, and was demobilized at Camp Dix, N. J., June 13, 1919.

CAMP HOSPITAL NO. 22 ^a

Camp Hospital No. 22 came into existence January 5, 1918, at Langres, Department Haute Marne, advance section, when Camp Hospital A was taken over by a medical detachment from Field Hospital No. 163 and was redesignated Camp Hospital No. 22. This hospital had been operated since November 15, 1917, by a detachment from the sanitary unit of the 9th Infantry, and had a bed capacity of 100. It occupied a three-story, stone building, situated outside the inner walls of the fortification of Langres, and was one of the group of buildings called Turenne Barracks. It served the seventh training area, but the majority of its admissions were from Army candidate and Signal Corps schools, at Langres. On June 11, 1918, the hospital was closed, but was reopened on June 26, 1918. It was finally closed on February 28, 1919, and its personnel were reassigned to other organizations for duty.

^a The statements of fact appearing herein are based on the "History, Camp Hospital No. 20, A. E. F.," Camp de Souge, by Lieut. Col. Edward F. Geddings, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^r The statements of fact appearing herein are based on the "History, Camp Hospital No. 21, A. E. F.," Bourbonnelles-Bains, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^a The statements of fact appearing herein are based on the "History, Camp Hospital No. 22, A. E. F.," Langres, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

CAMP HOSPITAL NO. 23¹

Camp Hospital No. 23 was established January 8, 1918, at Langres, Department Haute Marne, advance section, its personnel being taken from Field Hospital No. 163 and Ambulance Company, No. 163. The building in which it was located was part of the Collège de Jeunes Filles and had been occupied by the French Medical Department. Its bed capacity was 100. Many improvements had been made in the building, such as installation of running water, shower baths, and flush latrines. It also contained a completely equipped laboratory, pharmacy, and operating room. The hospital served the officers at the Army school headquarters at Langres and averaged about 45 patients



FIG. 151.—Camp Hospital No. 22, Langres

throughout its period of operation. The first patients were admitted February 1, 1918. During July, 1918, the Langres hospital center was opened; this, together with Camp Hospital No. 24, made the existence of Camp Hospital No. 23 no longer essential, so it was closed August 15, 1918, and its personnel were reassigned to other organizations for duty.

CAMP HOSPITAL NO. 24²

Camp Hospital No. 24 was established in January, 1918, at Langres, Department Haute Marne, advance section, and was operated by Field Hospital No. 165. This institution served the Langres training area and had a bed

¹ The statements of fact appearing herein are based on the "History, Camp Hospital No. 23, A. E. F.," Langres, by First Lieut. Alan C. Dutton, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

² The statements of fact appearing herein are based on the "History, Camp Hospital No. 24, A. E. F.," Langres, by Maj. Alexander Nicoll, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

capacity of 500. It occupied the French Hôpital Complémentaire No. 3, and consisted of a main building of 4 stories, an annex of 2 stories, and 2 other buildings, 1 of which was used as the kitchen and the other as the morgue. When we took them over, the hospital buildings were old and practically unfurnished; the entire plumbing system was in a poor condition. On March 13, 1918, hospital unit H, arrived and was assigned permanently to Camp Hospital No. 24, which it took over on March 27, 1918. The unit renovated the buildings and, after many difficulties, succeeded in installing some plumbing fixtures such as flush toilets and baths. During its existence, 6,288 patients were admitted; of these 4,487 were medical and 1,801 surgical cases. Camp Hospital No. 24 ceased to function March 15, 1919, and its personnel were transferred to Camp Hospital No. 118, Brest, for duty.

CAMP HOSPITAL NO. 25 *

Camp Hospital No. 25 was organized in January, 1918, at Blois, Department Loir et Cher, intermediate section, its personnel being obtained from the American Expeditionary Forces at large. It operated in 7 old, widely separated French buildings, with a normal bed capacity of 939. This institution was also used as a casual station for nurses. On July 3, 1918, Base Hospital No. 43 arrived and took over the operation of Camp Hospital No. 25. On January 20, 1919, Evacuation Hospital No. 35 relieved Base Hospital No. 43 and functioned until March 12, 1919, when it was skeletonized to 1 officer and 4 enlisted men, who were returned to the United States, and the hospital reverted to its former status, that of Camp Hospital No. 25. The remaining personnel of Evacuation Hospital No. 35 were transferred to Camp Hospital No. 25, remaining until closure of the hospital on May 13, 1919. The personnel of Camp Hospital No. 25 returned to the United States by way of Brest, sailing on the *America*, June 9, 1919, and were demobilized at Camp Upton, N. Y., June 22, 1919.

CAMP HOSPITAL NO. 26 *

Camp Hospital No. 26 was organized April 26, 1918, at Noyers, Department Loir et Cher, intermediate section, its personnel coming from Field Hospital No. 161. When established, the hospital occupied 15 wooden barracks, of the Morajan type, each accommodating 32 patients. In addition to the hospital at Noyers, two annexes were maintained, one of 200-bed capacity in Hôspice de St. Aignan, and another of 500-bed capacity, at Pont le Voy. The latter was used as a convalescent hospital. Camp Hospital No. 26, while considered a 1,500-bed hospital, often in emergency treated as many as 2,200 patients at one time. It served the entire first replacement depot at St. Aignan-Noyers, and up to December 31, 1918, admitted 15,967 medical and surgical cases. Its dental department grew in proportion to the hospital, and at one time there were 23 dental officers on duty. Also it was used as a school, training dental assistants for the whole American Expeditionary Forces. The hospital ceased to function on June 12, 1919, and its personnel returned to the United States on the *Antigone*. Sailing from St. Nazaire on June 18, 1919, the personnel arrived at Camp Hill, Va., June 28, 1919, and were demobilized shortly afterwards.

* The statements of fact appearing herein are based on the "History, Camp Hospital No. 25, A. E. F.," Blois, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

* The statements of fact appearing herein are based on the "History, Camp Hospital No. 26, A. E. F.," Noyers, by Lieut. Col. William C. Riddell, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*



FIG. 152.—Camp Hospital No. 24, Langres

CAMP HOSPITAL NO. 27 ^z

Camp Hospital No. 27 was established February 4, 1918, at Tours, Department Indre et Loire, intermediate section, and was operated by the personnel of of Evacuation Ambulance Company No. 3. The hospital occupied a former French military hospital, located in the École des Filles Superior, Tours. It served the Arrondissement of Tours, which included about 20,000 troops and approximately 18,000 German prisoners of war. When first taken over, the hospital accommodated about 300 patients; later, the capacity was increased to 650. On March 5, 1918, Evacuation Ambulance Company No. 3 was relieved by Mobile Hospital No. 1 (hospital unit K), which then took over Camp Hospi-



FIG. 153.—Interior, officers' ward, Camp Hospital No. 28, Nevers

tal No. 27. During the year ending February 4, 1919, this hospital admitted 4,063 medical and 937 surgical cases. Camp Hospital No. 27 ceased to function in August, 1919; its personnel sailed from Brest for New York August 10, 1919, and were demobilized August 25, 1919.

CAMP HOSPITAL NO. 28 ^v

Camp Hospital No. 28 was established February 4, 1918, at Nevers, Department Nièvre, Intermediate section, its personnel being obtained from the American Expeditionary Forces at large. It occupied a school building, L'école

^z The statements of fact appearing herein are based on the "History, Camp Hospital No. 27, A. E. F.," Tours, by First Lieut. Kenneth W. Pugh, M. C., while on duty as a member of the staff of that hospital. The History is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^v The statements of fact appearing herein are based on the "History, Camp Hospital No. 28, A. E. F.," Nevers, by the commanding officer of that hospital. The History is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

Normale d'Institutes, which at the time of the establishment of Camp Hospital No. 28 was used by the French Government as a military hospital. The Capacity of the hospital, as originally planned, was 150 beds, but later this was increased to 450. Camp Hospital No. 28 served not only the troops at Nevers but also those in the surrounding area, whose radius varied in extent from 20 to 40 miles. The number of troops ranged from 8,000 to 15,000. On March 7, 1918, hospital unit S reported for duty and took over the hospital. From February 4, 1918, to December 1, 1918, the hospital admitted a total of 3,030 surgical and medical cases. Camp Hospital No. 28 ceased to function June 13, 1919; its personnel sailed from St. Nazaire June 23, 1919, on the *Santa Cecilia*, and were demobilized at Camp Dix, N. J., July 10, 1919.



Fig. 154.—A group of wards, Camp Hospital No. 29, Le Courneau

CAMP HOSPITAL NO. 29 *

Camp Hospital No. 29 came into existence February 29, 1918, at Le Courneau, Department Gironde, base section No. 2, its personnel coming from the American Expeditionary Forces at large. The hospital was located on the outskirts of a large camp, which later became known as Camp Hunt, and occupied a number of buildings which had been used by the French as a military hospital. The bed capacity of the entire plant was 960. It served the miscellaneous troops in the Courneau area and at times received wounded from the forward areas. During its existence, the hospital admitted a total of 6,897 surgical and medical cases; the greatest number of patients in hospital at one time was 1,017, on September 23, 1918. Camp Hospital No. 29 ceased to function on March 1, 1919, and its personnel were reassigned to other organizations in the American Expeditionary Forces for further duty.

* The statements of fact appearing herein are based on the "History, Camp Hospital No. 29, A. E. F.," Le Courneau, by Maj. John G. Towne, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

CAMP HOSPITAL NO. 31^a

Camp Hospital No. 31 was established April 15, 1918, at Meucon, Department Morbihan, base section No. 1, its personnel being taken from the American Expeditionary Forces at large. The hospital occupied the site of what formerly had been the old French artillery training camp, and was erected to serve the artillery training camp for the American Expeditionary Forces, which was about 2 miles distant. It comprised 12 low buildings of wood and stone, which had been used by the French as quarters for the troops in training. In addition to these barracks, a new surgical building of brick and stone and quarters for the personnel were built; the total capacity was 700 beds. It ceased to function April 3, 1919, and its personnel were reassigned to other organizations for duty.



FIG. 155.—Camp Hospital No. 33, Camp Pontanezen

CAMP HOSPITAL NO. 33^b

Camp Hospital No. 33 was established January 15, 1918, at Camp Pontanezen, Department Finistere, base section No. 5, by a detachment of 5 medical officers and 40 enlisted men, detached from Base Hospital No. 34. When first opened, the hospital was located in an old French concrete building, which formerly had been used as barracks. Many difficulties were experienced at this time in the care of the sick, as hospital supplies were very difficult to obtain. Medical equipment consisted of the contents of medical and surgical chests. Except for candles, there were no lighting facilities. On February 1, 1918, in addition to the old stone barracks then occupied by the hospital,

^a The statements of fact appearing herein are based on the "History, Camp Hospital No. 31, A. E. F.," Meucon, by Lieut. Col. J. A. Worthington, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^b The statements of fact appearing herein are based on the "History, Camp Hospital No. 33, A. E. F., Camp Pontanezen, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

a fairly modern three-story, fireproof building was taken over. Later, when increased hospital facilities were necessary, 8 Adrian-type barracks were erected, to accommodate 35 patients each, and four 300-foot barracks. These structures completed the hospital plant inside the walls of Caserne de Pontan-ezen. When further expansion was necessary, 15 additional hospital buildings were constructed in the area outside the wall of the caserne, immediately behind the original hospital site, thus giving a maximum bed capacity of 2,600. Twenty-four additional wards, kitchens, supply rooms, dispensary, officers' and nurses' quarters were constructed in this area. Also, large huts were erected both on the inside and outside areas by the American Red Cross.

Camp Hospital No. 33 served the entire port of Brest. Although it treated more patients than did the majority of the base hospitals in France, and served the largest camp in the American Expeditionary Forces, it never was rated as a base hospital.

Due to the absence of any sewerage system and to the climatic conditions, the problem of sanitation was a serious one and became more complicated as the number of patients in hospital increased. Latrines of the can type were used, the cans being emptied by French contractors, who proved to be very unsatisfactory. The difficulty in rendering these latrines flyproof and sanitary was practically insurmountable; the use of an incineration plant was impracticable, due to the scarcity of wood and straw.

During the period from January 15, 1918, to June 30, 1919, this institution admitted 28,233 medical and surgical cases. The majority of its patients were medical, which up to June 30, 1919, included 4,814 cases of mumps, 3,521 of influenza, and 2,205 of pneumonia.

Camp Hospital No. 33 ceased to function December 29, 1919; its personnel sailed from Brest December 30, 1919, on the *George Washington*, and were demobilized at Camp Dix, N. J., shortly afterward.

CAMP HOSPITAL NO. 34^c

Camp Hospital No. 34 came into existence on March 20, 1918, when the camp infirmary at the American rest camp, Romsey, England, was designated Camp Hospital No. 34. This infirmary had been in operation since December 26, 1917, the personnel to operate it being detailed temporarily from organizations passing through the camp. At first, the hospital consisted of a small permanent building and four British hospital tents, of a capacity of about 14 beds. In the fall of 1918, 300-bed hospital was being constructed. During its existence as a camp hospital, it received 1,748 surgical and medical cases; largest number of patients admitted in one month was 433, in September, 1918. Camp Hospital No. 34 ceased to function November 30, 1918, its personnel being reassigned.

^c The statements of fact appearing herein are based on the "History, Camp Hospital No. 34, A. E. F.," Romsey, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

CAMP HOSPITAL NO. 35 ^d

Camp Hospital No. 35 was established January 19, 1918, at the American rest camp, Winchester, England, its personnel being taken from the American Expeditionary Forces casually at that camp. When opened, it was known as the United States hospital, American rest camp, Winchester, England, and on April 5, 1918, received its designation as Camp Hospital No. 35. It occupied two groups of structures, situated about one-eighth of a mile apart, in portion of the camp known as Avington Park. The capacity was intended to be 250 beds, but later additions were made so that the capacity of the hospital was 500, with an emergency expansion in tents to 679. The majority of the cases admitted were medical, among which were the cases of communicable disease among our troops arriving in England. During its existence, January 19, 1918, to February 4, 1919, it cared for 5,226 medical and 177 surgical cases. Camp Hospital No. 35 ceased to function February 4, 1919, and its personnel were reassigned to other stations for further duty.

CAMP HOSPITAL NO. 36 ^e

Camp Hospital No. 36 was established in February, 1918, at Southampton, England, to serve the Southampton rest area. At this time, the hospital was temporarily quartered in tents and had a capacity of 80 beds. Construction was begun on June 22, 1918, the type of construction being sectional huts. The wards were arranged in pairs, each pair connected by an ablution block, containing toilets, lavatories, and shower baths. The operating block and mess halls were to be connected with all the wards by a covered corridor, 5 feet wide. The hospital was about 50 per cent completed when construction was ordered stopped on November 28. During its existence, the hospital cared for 1,462 medical and 48 surgical cases. Camp Hospital No. 36 ceased operating December 2, 1918, and its personnel were reassigned to other organizations for duty.

CAMP HOSPITAL NO. 37 ^f

Camp Hospital No. 37 was established March 15, 1918, at Romarantin, Department Loir et Cher, intermediate section, to serve Air Service production center No. 2, located about 3 miles from Romarantin. The hospital was located in a school for young girls and was an old three-story building of brick and cement, having four wings and a cross bar forming the letter H; two of these wings were occupied by the hospital, the other two were retained by the school. Later, barracks, mess halls, and bathhouses were erected on the grounds for the personnel and several tents for patients to provide for emergency used and for contagious diseases. With these additions the bed capacity

^d The statements of fact appearing herein are based on the "History, Camp Hospital No. 35, A. E. F.," Winchester, England, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^e The statements of fact appearing herein are based on the "History, Camp Hospital No. 36, A. E. F.," Southampton, England, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^f The statements of fact appearing herein are based on the "History, Camp Hospital No. 37, A. E. F.," Romarantin, by Maj. Lucius F. Donohoe, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

was increased from 150 to 235. During its existence 2,279 medical and 152 surgical cases were admitted. Camp Hospital No. 37 ceased to function February 28, 1919, when its designation was changed to infirmary, Air Service production center No. 2.

CAMP HOSPITAL NO. 38 ^a

Camp Hospital No. 38 was established May 7, 1918, at Chatillon sur Seine, Department Cote d'Or, advance section. Its personnel was taken from the American Expeditionary Forces at large. It occupied hospital buildings taken over from the French, of 200-bed capacity, and served the personnel and students of the Second Army Corps schools. The plumbing and sanitary equipment of the hospital was very poor. During its existence, the hospital cared for 1,771 medical and 378 surgical cases. Camp Hospital No. 38 ceased to operate March 31, 1919; its personnel were returned to United States and demobilized in April, 1919.

CAMP HOSPITAL NO. 39 ^b

Camp Hospital No. 39 was established March 1, 1918, at La Rochelle, Department Charente Inferieure, base section No. 7, its personnel being assigned from the American Expeditionary Forces at large. It was located at a distance of about 2½ miles from La Rochelle, in an old stone building known as the Château Perigny, and in several wooden barracks, erected by the United States Engineers. The capacity of the hospital was 375 beds. It served the La Rochelle and La Pallice areas and began to receive patients on July 29, 1918. The base laboratory for base section No. 7 was located at the hospital and performed all bacteriological work for that section. The hospital ceased to operate May 16, 1919; its personnel returned to the United States, sailing from Bordeaux for New York, on the *Ohioan*, June 9, 1919, and were demobilized at Camp Dix, N. J., shortly afterward.

CAMP HOSPITAL NO. 40 ^c

Camp Hospital No. 40 was established in April, 1918, at the American rest camp, Knotty Ash, Liverpool, England. When first established, it consisted of a number of marquee tents of about 150-bed capacity and was intended as a contagious disease hospital for the Liverpool rest camp. From May 27, 1918, to June 6, 1918, the hospital was operated by hospital unit Q and from June 7, 1918, by hospital unit W. On August 10, 1918, a contract was let for a permanent 500-bed hospital of brick and concrete construction. The new institution consisted of two separate divisions, a general section and a contagious disease section. These sections were so constructed as to permit their use as a whole or independently of each other.

^a The statements of fact appearing herein are based on the "History, Camp Hospital No. 38 (A. E. F.," Chatillon sur Seine, by First Lieut. Joseph M. Weldon, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^b The statements of fact appearing herein are based on the "History, Camp Hospital No. 39, (A. E. F.," La Rochelle, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^c The statements of fact appearing herein are based on the "History, Camp Hospital No. 40, (A. E. F.," Knotty Ash, Liverpool, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

The general section consisted of an administration building, a modern surgery, six wards, kitchen, messes, and a large recreation hall. The buildings were connected by a canopied runway which started at the center of the administration building and traversed the entire block. Also there were a central heating plant and quarters for the personnel. The contagious disease section consisted of an administration building, 11 wards and a kitchen, all connected by a canopied runway.

Due to the shortage of labor and to frequent strikes, the new hospital was not ready for occupancy until the latter part of January, 1919, although some parts of it were put to use in December, 1918. During its existence, the hospital cared for 3,909 medical and 901 surgical cases. The greatest number of patients in hospital was 859, on September 30, 1918.



FIG. 156.—Camp Hospital No. 41, Is-sur-Tille

Camp Hospital No. 40 ceased to function April 30, 1919; its personnel sailed from Brest May 4, 1919, on the *Haverford*, and were demobilized at Camp Grant, Ill., May 23, 1919.

CAMP HOSPITAL NO. 41ⁱ

Camp Hospital No. 41 was opened on March 11, 1918, at Is-sur-Tille, Department Côte d'Or, advance section, its personnel coming from the American Expeditionary Forces at large. It was of barrack construction and consisted of an administration building, nine wards, supply building, mess halls, and personnel quarters; its capacity when completed was 500 beds. It served the command at Camp Williams, Is-sur-Tille, which at times numbered as many as 24,000, and all the sick taken from troop trains passing through the regulating station at Is-sur-Tille. All cases for X ray, and all eye, ear, nose, and throat cases needing special treatment were transferred from it to Base Hos-

ⁱ The statements of fact appearing herein are based on the "History, Camp Hospital No. 41, A. E. F.," Is-sur-Tille, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

pital No. 17, at Dijon; also most of the laboratory work was done at the central Medical Department laboratory at Dijon. Prior to October 1, 1918, all major surgical cases and fracture cases were transferred to Dijon, and only minor surgical and emergency cases were treated locally; however, after a large surgical ward with modern operating room had been completed in October, all surgical cases admitted were cared for at Camp Hospital No. 41.

During its first year, March 11, 1918, to March 31, 1919, the hospital admitted 12,270 medical and surgical cases; the greatest number of patients admitted in one month was 1,589, in December, 1918.

The hospital ceased to function May 23, 1919; its personnel sailed from Brest, July 1, 1919, on the *President Grant*, and were demobilized at Camp Devens, Mass., shortly afterwards.

CAMP HOSPITAL NO. 42 ^k

Camp Hospital No. 42 came into existence in May, 1918, at Bar-sur-Aube, Department Aube, advance section, and was operated by the personnel of



FIG. 157.—Camp Hospital No. 42, Bar-sur-Aube

Ambulance Company No. 161. It occupied a type B, 300-bed unit, constructed by the United States Engineers, and served the thirteenth training area, which was occupied successively by the Artillery headquarters of the Army, the 5th and 36th Divisions, and headquarters of the first Army. It was not fully equipped until the latter part of July and August, 1918, when it began to function to its full capacity. From June 5, 1918, to October 26, 1918, the hospital was operated by Ambulance Company No. 42; subsequently by personnel from the American Expeditionary Forces at large. From May 5, 1918, to March 1, 1919, 3,274 patients were admitted; of these 3,039 were medical and 235 surgical. The greatest number of patients in hospital was 478, on September 27, 1918. Camp Hospital No. 42 ceased to function April 20, 1919; its personnel sailed from Marseille, May 15, 1919, on the *Canada* and were demobilized at Camp Dodge, Iowa., June 9, 1919.

^k The statements of fact appearing herein are based on the "History, Camp Hospital No. 42, A. E. F.," Bar-sur-Aube, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

CAMP HOSPITAL NO. 43¹

Camp Hospital Hospital No. 43 came into existence in April, 1918, at Gievres, Department Loir et Cher, intermediate section, when the post hospital there was designated Camp Hospital No. 43. The post hospital had been in operation since November, 1917, and prior to February 25, 1918, was known as the regimental infirmary, 15th Engineers. It served the various troops and civilian laborers (Chinese and Spanish) stationed at Gievres. When first established the hospital consisted of two wooden barracks; however, when construction was completed in September, 1918, it operated in 24 buildings, of 400-bed capacity. In addition to the barracks, about 20 hospital tents were used constantly for the accommodation of the large number of mumps cases brought in with arriving troops. In August, 1918, an X-ray machine was installed, and the hospital functioned practically as a base hospital. Prior to that time, all major surgical cases and fractures were transferred to Base Hospital No. 9, at Chateauroux.

On February 10, 1919, Base Hospital No. 94, operating at Pruniers, ceased to function as a base hospital and became a part of Camp Hospital No. 43. Base Hospital No. 94 consisted of 50 buildings. On taking over this hospital, the old camp hospital was designated a contagious-disease hospital and used for contagious, skin, and venereal diseases. Camp Hospital No. 43 ceased operating in August, 1919, and its personnel were returned to United States.

CAMP HOSPITAL NO. 44^m

Camp Hospital No. 44 was established April 14, 1918, at Riom, Department of Puy-de-Dome, intermediate section, its personnel coming from the American Expeditionary Forces at large. The hospital occupied the picturesque old Château de Miroble, which was leased from the owner, and is located about 10 km. from the city of Clermont-Ferrand. The original function of the establishment was to serve the seventh aviation instruction center. First patient was admitted on April 25, 1918, and from July to December, 1918, the bed capacity of 200, was not entirely utilized by the sick of the flying field; many ambulatory and slightly wounded were received from Base Hospitals Nos. 20 and 30. Camp Hospital No. 44 ceased operating December 4, 1918, and the personnel were distributed to other hospitals in the American Expeditionary Forces.

CAMP HOSPITAL NO. 45ⁿ

Camp Hospital No. 45 was established July 8, 1918, at Aix-les-Bains, Department Savoie, intermediate section, its personnel coming from the American Expeditionary Forces at large. The hospital occupied the Leon Blanc Hospital, on the outskirts of Aix-les-Bains. The establishment served the Aix-les-Bains leave area and cared for sick and injured from all the surrounding areas. During the summer most of the patients were victims of

¹The statements of fact appearing herein are based on the "History, Camp Hospital No. 43, A. E. F.," Gievres, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^mThe statements of fact appearing herein are based on the "History, Camp Hospital No. 44, A. E. F.," Riom, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

ⁿThe statements of fact appearing herein are based on the "History, Camp Hospital No. 45, A. E. F.," Aix-les-Bain, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

bicycle accidents and mountain climbs. In the fall of the year, influenza and pneumonia made its appearance and necessitated the erection of several wooden barracks to accommodate the large increase of hospital admissions; the bed capacity of hospital expanded from 70 to 260. Camp Hospital No. 45 ceased operating May 23, 1919; its personnel sailed from Brest June 29, 1919, on the *General Washington*, and were demobilized at Camp Grant, Ill., July 12, 1919.

CAMP HOSPITAL NO. 46 *

Camp Hospital No. 46 was established May 16, 1918, at Landerneau, a small town about 14 miles east of Brest, Department Finistere, base section



FIG. 158.—Camp Hospital No. 45, Aix-les-Bains

No. 5. Its personnel were assigned from the American Expeditionary Forces at large. It occupied a part of a large French convent school, the Pensionnat du Calvare, which was suitable for hospital purposes, as it contained many large well lighted and ventilated rooms; however, the sanitary arrangements were exceedingly poor and no adequate water supply existed. A detachment of United States Engineers was attached to the hospital to install the necessary plumbing and to provide a sufficient water supply; also several wooden barracks for the personnel were constructed by the Engineers, and the bed capacity of the hospital was increased from 250 to 300. Camp Hospital

* The statements of fact appearing herein are based on the "History, Camp Hospital No. 46, A. E. F.," Landerneau, by Maj. James Breslin, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

No. 46 was intended for convalescent patients only, but it received cases of acute disease and of injury from its surrounding area. During December, 1918, only venereal cases en route to the United States were admitted. The total number of patients admitted during its existence was 1,150. The hospital was closed February 28, 1919, and its personnel were transferred to Camp Pontanezen, Brest, for duty.

CAMP HOSPITAL NO. 47 ^p

Camp Hospital No. 47 was established in June, 1918, at Autun, Department Saone et Loire, intermediate section, its personnel coming from the American Expeditionary Forces at large. This organization remained until



FIG. 159.—Camp Hospital No. 46, Landerneau

July 30, 1918, when it was relieved by Base Hospital No. 45. The base hospital unit remained until August 19, 1918, when it was transferred to Toul for duty. The hospital remained vacant until September 24, 1918, when casual personnel arrived and reestablished Camp Hospital No. 47, which then occupied a French building, the Caserne Billard, originally a seminary and later used by the French as barracks; its capacity was 500 beds. The first patients were received October 10, 1918, from a hospital train, about 344 in number and nearly all convalescing. This institution functioned as a camp hospital until November 1, 1918, when its designation was changed to Base Hospital No. 208.

^p The statements of fact appearing herein are based on the "History, Camp Hospital No. 47, A. E. F.," Autun, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

CAMP HOSPITAL NO. 48 *

Camp Hospital No. 48 came into existence in June, 1918, at Recey-sur-Ource, Department Côte d'Or, advance section, and was operated by Field Hospital No. 42. It occupied a type B, 300-bed unit and served the fourteenth training area, which was occupied by the Sixth Division. On October 28, 1918, Field Hospital No. 42 was relieved from duty at Camp Hospital No. 48 and casual personnel were assigned in its place. Over 5,000 patients were cared for in this institution. Camp Hospital No. 48 ceased to function on May 27, 1919; its personnel sailed from Brest on June 22, 1919, on the *Montana*, and upon arrival in the United States were transferred to Camp Dodge, Iowa, for demobilization.



FIG. 160.—Camp Hospital No. 48, Recey-sur-Ource

CAMP HOSPITAL NO. 49 †

Camp Hospital No. 49 was instituted in July, 1918, at Laignes, Department Cote d'Or, advance section, and was operated by personnel from the American Expeditionary Forces at large. It was located in a type B, 300-bed unit and served the fifteenth training area, which was occupied by the 7th and, later, by the 80th Division. Only minor medical and emergency surgical cases were treated; all major surgical cases were transferred to Base Hospital No. 17 at Dijon. Patients were first admitted September 22, 1918; and during its existence, 2,658 surgical and medical cases were cared for. The greatest number of patients admitted in one month was 803, in December, 1918. Camp Hospital No. 49 ceased operating April 11, 1919, and its personnel were returned to the United States.

* The statements of fact appearing herein are based on the "History, Camp Hospital No. 48, A. E. F.," Recey-sur-Ource, by Lieut. Col. Alva S. Pinto, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

† The statements of fact appearing herein are based on the "History, Camp Hospital No. 49, A. E. F.," Laignes, by Capt. C. P. Gammon, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

CAMP HOSPITAL NO. 50 *

Camp Hospital No. 50 was established in September, 1918, at Tonnerre, Department Yonne, advance section, its personnel coming from Sanitary Squads Nos. 8, 17, and 38. It occupied a type B, 300-bed unit and served the sixteenth training area, which was successively occupied by the 81st Division, First Army Corps, 36th and 80th Divisions. The majority of the surgical cases cared for at this hospital were emergency and minor cases; all major and chronic surgical conditions were transferred to Base Hospital No. 17, at Dijon. During its existence, the hospital cared for 4,120 surgical and medical cases; the greatest number of patients admitted in one month was 835, in February, 1919. Camp Hospital No. 50 ceased operating May 5, 1919; its personnel sailed June 15, 1919, from St. Nazaire on the *Teran*, and were demobilized at Camp Dix, N. J.

CAMP HOSPITAL NO. 51 †

Camp Hospital No. 51 was authorized June 19, 1918, at Roanne, Department Loire, intermediate section. It occupied 2 separate groups of buildings about one-half mile apart, 1 consisting of 12 French wooden barracks, the other of 4 stone buildings; the total capacity was 800 beds. Both of the groups were well-equipped, containing modern lighting facilities and sewer systems. In July, 1918, Base Hospital No. 48 was assigned to this station for duty, but remained only a few days. The hospital remained unoccupied until in September, 1918, when permanent personnel was assigned. The majority of the patients received were convalescents from the hospital center at Vichy. During its existence, the hospital cared for approximately 3,000 surgical and medical cases; the greatest number of patients in hospital at one time was 1,108. It ceased to operate November 21, 1918, and its personnel, with the exception of a few officers, were transferred to Camp Hospital No. 57, at St. Amand, for duty.

CAMP HOSPITAL NO. 52 ‡

Camp Hospital No. 52 was established in August, 1918, at Le Mans, Department Sarthe, intermediate section, its personnel being taken from the American Expeditionary Forces at large. It was located in the old monastery, which had been occupied by the French complementary hospital No. 49. The monastery was poorly suited for hospitalization, for its large halls and high ceilings and stone floors made it damp and difficult to heat. Plumbing and wiring were insufficient and a large force of men was required to keep the building in repairs. In addition to the monastery,*2 schools, a girls' and a boys' normal school, each accommodating about 200 patients, were taken

* The statements of fact appearing herein are based on the "History, Camp Hospital No. 50, A. E. F.," Tonnerre, by Capt. Samuel L. Wadley, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

† The statements of fact appearing herein are based on the "History, Camp Hospital No. 51, A. E. F.," Roanne, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

‡ The statements of fact appearing herein are based on the "History, Camp Hospital No. 52, A. E. F.," Le Mans, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

over from the French. These schools were only a few hundred yards distant from the main building and were designated as annex Nos. 1 and 2, respectively. Annex No. 3, a mumps camp under canvas, was erected about 750 yards from the main building; it accommodated about 750 patients. The total normal bed capacity was 1,700, although in emergency as high as 2,000 patients were cared for at one time. The strength of personnel varied; during the winter of 1918-19, it averaged 60 officers, 650 enlisted men, and 90 nurses. This institution served the 2d Depot Division area, which at times contained as many as 200,000 troops. It handled a large number of patients, and up to December 31, 1918, admitted among others over 4,500 cases of mumps; the surgical-service performed 380 operations. It was well equipped in all departments and practically functioned as a base hospital. No battle casualties were received.

Camp Hospital No. 52 ceased operating July 1, 1919; its personnel sailed from Brest July 5, 1919, on the *Prinz Friedrich Wilhelm*, and were demobilized at Camp Gordon, Ga., July 23, 1919.

CAMP HOSPITAL NO. 53^{*}

Camp Hospital No. 53 was organized in September, 1918, at Marseille, Department Bouchet du Rhone, base section No. 6; its personnel came from the American Expeditionary Forces at large. It was located on the principal street of Marseille, the Boulevard Prado, and occupied a large stone building formerly used as a theological institution. Its original bed capacity of 300 was increased to 500. Camp Hospital No. 53 served the port of Marseille and was opened for patients on September 25, 1918. The hospital ceased to function in June, 1919; its personnel returned to the United States and were demobilized at Camp Taylor, Ky., on July 23, 1919.

CAMP HOSPITAL NO. 54[†]

Camp Hospital No. 54 was established in September, 1918, at Beaulieu, Department Dordogne, base section No. 2, its personnel coming from the American Expeditionary Forces at large. It was located in Château la Roche, a fairly modern, three-story, country estate, built of stone; however, the château had been unoccupied for many years prior to the war, and it was not in a good state of repair. The area served by the hospital soon was unexpectedly occupied by the 84th Division, and much difficulty was experienced in obtaining food, supplies, and transportation for the sick. The normal capacity of hospital was 150 beds. On October 2, 1918, Field Hospital No. 333 took over the hospital, and its designation was changed to Camp Hospital No. 78 (q. v.) The personnel were transferred to the new organization for duty.

^{*} The statements of fact appearing herein are based on the "History, Camp Hospital No. 53, A. E. F.," Marseille, by Maj. S. Calvin Smith, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

[†] The statements of fact appearing herein are based on the "History, Camp Hospital No. 54, A. E. F.," Beaulieu, by Maj. Bernard J. Beanker, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

CAMP HOSPITAL NO. 55^z

Camp Hospital No. 55 was established during the month of January, 1918, at Ferrieres, Department Loiret. It was located in an old stone monastery which had been used as a hospital by the French during the early period of the war. The personnel of this hospital was drawn from the United States Army Ambulance Service with the French Army. The function of the hospital was to care for the sick of that organization. It ceased operating on May 18, 1919.

CAMP HOSPITAL NO. 56^v

Camp Hospital No. 56 was established July 29, 1918, at Avoine, Department Indre et Loire, intermediate section, for the purpose of serving the Chinon



FIG. 161.—One of the buildings, Camp Hospital No. 56, Avoine

area. Its personnel were assigned from the American Expeditionary Forces at large and averaged 3 medical officers and 21 enlisted men. It was located in a modern château, about one-half mile from Avoine, and had a bed capacity of 80. The château was well equipped with baths, laundry, and a lighting plant, and was situated on 25 acres of open ground. Camp Hospital No. 56 functioned until January 14, 1919, when it was abandoned and the personnel were reassigned to other stations for duty.

^z The statements of fact appearing herein are based on the "History, Camp Hospital No. 55, A. E. F.," Ferrieres, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^v The statements of fact appearing herein are based on the "History, Camp Hospital No. 56, A. E. F.," Avoine, by Capt. John E. McQuain, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

CAMP HOSPITAL NO. 57 ^a

Camp Hospital No. 57 was established in August, 1918, at St. Amand Mont Rond, Department Cher, intermediate section, to care for the sick and wounded of the 3d Depot Division. It was located in portion of the French hospital of that city and occupied two 10-bed wards and four 2-bed rooms. Through the courtesy of the sisters in charge of the hospital the operating room was available for emergency use. The personnel came from Field Hospital No. 303. On September 1, 1918, the hospital was moved to a building which formerly had been a private school, accommodating about 150 patients. Twelve beds for acute surgical cases were reserved at the French hospital and all operations were performed at the latter institution. The number of patients averaged from 120 to 160. The 3d Depot Division was discontinued about November 1, 1918, and the personnel of the hospital were skeletonized to 1 officer and 12 enlisted men. It continued to function until January 31, 1919, when it was closed and the personnel were reassigned to other stations for duty.

CAMP HOSPITAL NO. 59 ^a

Camp Hospital No. 59 was established August 21, 1918, at Issoudun, Department Indre, intermediate section, by casual personnel. It occupied the buildings of the École Sacré Coeur, a school for boys, a large four-story building with a large park. Prior to its occupation by Camp Hospital No. 59, this building had been used by the French Hôpital Complémentaire No. 43. Many improvements and repairs were required as there were no baths of any kind, the lighting facilities were uncertain, and sanitary appliances were inadequate. The capacity was 600 beds. Patients were received first on September 8, 1918, and during its existence the hospital admitted a total of 1,404 surgical and medical cases. Three convoys of patients were received from the advanced areas by hospital trains; the largest number of patients in hospital was 580, September 20, 1918. During September, 1918, when the admission rate was at its height, Field Hospital No. 156 was assigned to Camp Hospital No. 59 for temporary duty. On February 18, 1919, all patients were transferred to Base Hospital No. 63, at Chateauroux, and the hospital ceased operating on that date. Its personnel were reassigned to other stations for duty.

CAMP HOSPITAL NO. 61 ^b

Camp Hospital No. 61 was organized in August 1918 at Poitiers, Department Vienne, intermediate section; its personnel were assigned from the American Expeditionary Forces, at large. It was located in the Ancienne Seminaire, which had been occupied by the French Hôpital Temporaire No. 16, and was taken over with its entire equipment on August 28, 1918. On September 18,

^a The statements of fact appearing herein are based on the "History, Camp Hospital No. 57, A. E. F.," St. Amand Mont Rond, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^a The statements of fact appearing herein are based on the "History, Camp Hospital No. 59, A. E. F.," Issoudun, by Maj. Charles O. Boswell, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^b The statements of fact appearing herein are based on the "History, Camp Hospital No. 61, A. E. F.," Poitiers, by First Lieut. John E. Treivweiler, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

a part of the École de Théologie, then occupied by Hôpital Temporaire No. 21, was taken over, bringing the normal bed capacity of the entire hospital up to 480. Patients were received first on September 22, 1918, and the first hospital train arrived on November 5, 1918, with 471 battle casualties. On that date the designation of Camp Hospital No. 61 was changed to Base Hospital No. 218. The institution functioned as a base hospital until February 13, 1919, when its status was again changed to that of Camp Hospital No. 61, whereupon the greater part of the plant was discontinued and the buildings were returned to the French; the bed capacity was reduced to 75. The hospital was officially closed on May 28, 1919, its personnel sailed from Brest June 26, 1919, on the *Noordam*, and were demobilized at Camp Upton, N. Y.



FIG. 162.—Camp Hospital No. 59, Issoudun

CAMP HOSPITAL NO. 62^c

Camp Hospital No. 62 was organized in August, 1918, at Sancerre, Department Cher, intermediate section. Its personnel came from the American Expeditionary Forces at large. It was located in the hotel Pont du Jour, a four-story, steam-heated and electrically lighted structure of 125-bed capacity, and served the 4th Depot Division. In addition to the hospital at Sancerre, two auxiliary hospitals were opened about the middle of August, 1918, one at Veaugues, operated by Field Hospital No. 338, and one at Cosne, operated by Field Hospital No. 339. These auxiliary hospitals were intended

^c The statements of fact appearing herein are based on the "History, Camp Hospital No. 62, A. E. F.," Sancerre, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

for the treatment of infectious diseases only. Total number of patients treated by Camp Hospital No. 62 was 841. It ceased to operate on November 1, 1918, and its personnel were reassigned to other stations for duty.

CAMP HOSPITAL NO. 64 ^d

Camp Hospital No. 64 was established in August, 1918, at Chatillon, Department Côte d'Or, advance section, and occupied a type B, 300-bed unit. The enlisted personnel was assigned from Sanitary Squads Nos. 54 and 63, replaced later by casals. It was opened for the reception of patients on September 26, 1918. Camp Hospital No. 64 served the twelfth training area, then occupied by the 81st Division; during its existence it received 1,340 medical and surgical cases. The hospital ceased operating May 20, 1919, and the personnel sailed for New York from St. Nazaire June 14, 1919, on the *Santa Barbara*.



FIG. 163.—Camp Hospital No. 64, Chatillon-sur-Seine

CAMP HOSPITAL NO. 65 ^e

Camp Hospital N. 65 was established in October, 1918, at Semur, Department Côte d'Or, advance section, and was operated by personnel from the American Expeditionary Forces at large. It was located in a type B, 300-bed unit and served the twenty-first training area, then occupied by the 78th Division. The hospital received both surgical and medical cases; the first patients were admitted November 17, 1918. Since the operating room and surgical wards were not opened until December 3, 1918, prior to that time all surgical cases had to be transferred to Base Hospital No. 17 at Dijon. Camp Hospital No. 65 ceased to function May 8, 1919; its personnel sailed May 30, 1919, from Marseille on the *Madonta* and were demobilized at Camp Grant, Ill., June 24, 1919.

^d The statements of fact appearing herein are based on the "History, Camp Hospital No. 64, A. E. F.," Chatillon, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

^e The statements of fact appearing herein are based on the "History, Camp Hospital No. 65, A. E. F.," Semur, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

CAMP HOSPITAL NO. 66 ^f

Camp Hospital No. 66 came into existence in August, 1918, when the infirmary, Camp St. Sulpice, Department Gironde, base section No. 2, was designated Camp Hospital No. 66. Personnel came from the American Expeditionary Forces at large. At this time, the hospital operated in several wooden barracks and tents. In November, 1918, a new hospital having been completed, was taken over by Camp Hospital No. 66. It consisted of 28 barrack wards of corrugated iron, finished inside with beaver board and wood, and accommodated 400 patients. It served the Libourne area, then occupied by United States Engineers, a labor battalion, and prisoners of war. The total population of the camp was approximately 10,000. The hospital ceased to function June 9, 1919. The personnel sailed from Bordeaux June 19, 1919, on the *Infanta Isabella*, arrived at Camp Merritt, N. J., June 30, 1919, and were demobilized at Camp Upton, N. Y., shortly afterward.

CAMP HOSPITAL NO. 67 ^g

Camp Hospital No. 67 was established in November, 1918, at Chemilly, Department Yonne, advance section, and was operated by personnel taken from the American Expeditionary Forces at large. On December 12, 1918, Field Hospital No. 42, with its full equipment, was attached for duty. The hospital was housed in several wooden barracks and served the nineteenth training area. Patients were received first on December 23, 1918. There were but very few troops stationed in the area served by this hospital and the maximum number of patients in hospital at any one time was 29. It ceased to function March 25, 1919, and its personnel were reassigned to other stations for duty.

CAMP HOSPITAL NO. 68 ^h

Camp Hospital No. 68 was established September 18, 1918, at Bourges, Department Cher, intermediate section, and was operated by personnel taken from the American Expeditionary Forces at large. It occupied a part of the Collège de Jeunes Filles, an old three-story stone building, which formerly had been used by the French as a hospital. Later, another three-story building was taken over and operated as an annex to Camp Hospital No. 68. The hospital was well equipped, and its normal bed capacity was 350, with emergency expansion to 400. It was established for the care of the personnel at the central records office and postal express service, which included 500 British female employees (W. A. A. C.)

It ceased to function June 12, 1919; the personnel sailed from Brest July 1, 1919, on the *President Grant* and were demobilized at Camp Devens, Mass., July 13, 1919.

^f The statements of fact appearing herein are based on the "History, Camp Hospital No. 66, A. E. F.," St. Sulpice, by Lieut. Col. O. W. Pinkston, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^g The statements of fact appearing herein are based on the "History, Camp Hospital No. 67, A. E. F.," Chemilly by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^h The statements of fact appearing herein are based on the "History, Camp Hospital No. 68, A. E. F.," Bourges, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

CAMP HOSPITAL NO. 70ⁱ

Camp Hospital No. 70 was established in September, 1918, at St. Florent sur Cher, Department Cher, intermediate section, and was operated for a time by Field Hospital No. 156. It was located in an old factory building of 300-bed capacity and served the 5th Depot Division, Field Hospital No. 156 was relieved from duty at the hospital, January 13, 1919, and was replaced by a detachment of casuels. On January 25, 1919, all patients were evacuated to Camp Hospital No. 59 at Issoudun, and the hospital ceased operating January 31, 1919. The personnel were reassigned to other stations for duty.



FIG. 164.—Camp Hospital No. 68, Bourges

CAMP HOSPITAL NO. 72ⁱ

Camp Hospital No. 72 was established September 26, 1918, at Chateau-du-Loir, Department Sarthe, intermediate section, by personnel taken from the American Expeditionary Forces at large. When first organized, it occupied four rooms in the Hôtel de la Gar, but on October 11, 1918, it was moved to the École Primaire Supérieure des Garçons. The school was a modern, three-

ⁱ The statements of fact appearing herein are based on the "History, Camp Hospital No. 70, A. E. F.," St. Florent, by Capt. Harry C. Fulton, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

ⁱ The statements of fact appearing herein are based on the "History, Camp Hospital No. 72, A. E. F.," Chateau-du-Loir, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

story building of 26 rooms, well adapted for hospital purposes, and had a bed capacity of 300. The hospital served the Quartermaster Department depot at Chateau-du-Loir and miscellaneous troops in that area. Camp Hospital No. 72 ceased to function May 14, 1919; part of its personnel and all supplies were transferred to Camp Hospital No. 114 at Ecommoy. The remaining personnel sailed from Brest, June 25, 1919, on the *Seattle*, and were demobilized at Camp Upton, N. Y., July 9, 1919.



FIG. 165.—Camp Hospital No. 72, Chateau-du-Loir

CAMP HOSPITAL NO. 73 ^k

Camp Hospital No. 73 was organized October 1, 1918, at Le Blanc, Department Indre, intermediate section, for the purpose of caring for the sick of the Field Artillery motor training camp there. It was established in the building of the Collège des Garçons, in which there were adequate and ample facilities for wards and quarters for the personnel. The personnel came from casualties arriving overseas late in 1918. The total number of patients admitted was 150. The hospital was closed January 8, 1919, and its personnel were reassigned to other stations for duty.

^k The statements of fact appearing herein are based on the "History, Camp Hospital No. 73, A. E. F.," Le Blanc, by Maj. George H. Stagner, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

CAMP HOSPITAL NO. 75 ^l

Camp Hospital No. 75 was established October 5, 1918, at Loches, Department Indre et Loire, intermediate section. Its personnel came from the American Expeditionary Forces at large. It was located in the buildings of the normal school of Loches, and was of 300-bed capacity. The school was suitable for hospital purposes and consisted of three separate buildings, all equipped with modern sanitary fixtures, and running hot and cold water. The hospital functioned until November 21, 1918, when it was closed and its personnel were reassigned to other stations for duty.

CAMP HOSPITAL NO. 76 ^m

Camp Hospital No. 76 began about March 1, 1918, as a small regimental infirmary of the 501st Engineers, located at Mehun sur Yevre, Department Cher, intermediate section. At that time the entire infirmary was housed in one Adrian barrack. Early in October, 1918, construction of the hospital was begun by the 501st Engineers and it was completed within the month. When completed, the hospital consisted of 10 barracks, all connected by a closed corridor, and accommodated 150 patients. Tents also were erected from time to time and the bed capacity of the hospital could be expanded to 300 beds. The hospital served approximately 7,000 troops located in various camps in that area. During its existence it cared for 2,936 medical and 123 surgical cases. Camp Hospital No. 76 ceased operating June 10, 1919, and its personnel, with the exception of one officer and three enlisted men, was reassigned to other stations for duty. The skeletonized Camp Hospital No. 76 returned to the United States, sailing from St. Nazaire June 23, 1919.

CAMP HOSPITAL NO. 77 ⁿ

Camp Hospital No. 77 was established in October, 1918, at Montmorillon, Department Vienne, intermediate section, by personnel from the medical replacement unit No. 37. It was located in a school for boys, the Seminaire Cardinal Pie, which was quite suitable for hospital purposes. The hospital with a bed capacity of 200, served the Montmorillon training area. As there were no civilian doctors in the village of Montmorillon, the medical officers at the hospital held daily sick call for the civilian population in the surrounding area. During the existence of this hospital, approximately 500 medical and surgical cases were cared for. It ceased to operate November 28, 1918, when all remaining patients were transferred to Base Hospital No. 28, at Limoges. The personnel were reassigned to other medical organizations for further duty.

^l The statements of fact appearing herein are based on the "History, Camp Hospital No. 75, A. E. F.," Loches, by Capt. C. H. Courtney, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^m The statements of fact appearing herein are based on the "History, Camp Hospital No. 76, A. E. F.," Mehun sur Yevre, by Maj. John C. O'Connor, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

ⁿ The statements of fact appearing herein are based on the "History, Camp Hospital No. 77, A. E. F.," Montmorillon, by Capt. Frederick C. Warfel, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

CAMP HOSPITAL NO. 78 °

Camp Hospital No. 78 came into existence October 2, 1918, when the designation of Camp Hospital No. 54, at Beaulieu, Department Dordogne, base section No. 2, was changed to that of Camp Hospital No. 78. On that date Field Hospital No. 333 took over and operated the hospital. The normal bed capacity was 150, but during the epidemic of influenza in October, 1918, 6 ward tents, capacity of about 20 cots each, were erected on the hospital grounds for convalescent patients. The hospital ceased to function with the departure of the 84th Division on November 30, 1918, and its personnel was reassigned. During its existence, 756 cases were admitted, including patients cared for by Camp Hospital No. 54 (q. v.).

CAMP HOSPITAL NO. 79 °

Camp Hospital No. 79 was opened on October 22, 1918, at St. Andre de Cubzac, Department Gironde, base section No. 2, and was the outgrowth of the infirmary, headquarters detachment of the 86th Division. It was located in the Château du Bouilh, an old structure built in the sixteenth century, and accommodated 90 patients. In addition to the building, three ward tents were erected on the lawn of the château, making the total bed capacity 150. An operating room was equipped to care for emergency surgery, and several major operations were performed; 713 medical and surgical cases were admitted during the existence of the hospital. Camp Hospital No. 79 served the east Bordeaux area, which was occupied by troops awaiting entrance to the Bordeaux embarkation camp. It ceased to function May 21, 1919, and its personnel were transferred to other stations.

CAMP HOSPITAL NO. 82 °

Camp Hospital No. 82 was organized on October 29, 1918, at Le Havre, base section No. 4, and operated by personnel taken from the American Expeditionary Forces at large. It was established for the care of troops passing through the port of Le Havre and occupied the Hotel Frascati, a large modern building, composed of three wings, inclosing a large court. This building had been used as a hospital by the French ever since the outbreak of the war in 1914. It was well suited for hospital purposes and accommodated about 400 patients. Patients were received first on November 15, 1918; during its activity this institution cared for 1,771 medical and surgical cases. The hospital operated until April 30, 1919, when it was closed and the personnel were reassigned to other hospitals for duty.

° The statements of fact appearing herein are based on the "History, Camp Hospital No. 78, A. E. F.," Beaulieu, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington D. C.—*Ed.*

° The statements of fact appearing herein are based on the "History, Camp Hospital No. 79, A. E. F.," St. Andre de Cubzac, by Capt. Edward J. Strickler, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

° The statements of fact appearing herein are based on the "History, Camp Hospital No. 82, A. E. F.," Le Havre, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

CAMP HOSPITAL NO. 85^r

Camp Hospital No. 85 was organized on November 8, 1918, at Montoir, Department Loire Inferieure, base section No. 1, and was the outgrowth of the former infirmary of that camp. The construction of the hospital was completed during the month of November, 1918, and consisted of 28 wooden barracks of 400-bed capacity. It served the Pont Chateau area and supply depot; the majority of patients received were cases of contagious and infectious diseases. Total number of patients treated in hospital from August, 1918, to February 28, 1919, was 2,540. On June 6, 1919 Camp Hospital No. 85 reverted to its former status, its personnel remaining on duty there.

CAMP HOSPITAL NO. 87^r

Camp Hospital No. 87 was established about October 1, 1918, at Cour Cheverny, Department Loir et Cher. It was located in the Château Chautreuil, with a total bed capacity of about 100, and its function was to care for the sick of the Signal Corps replacement area. Personnel were drawn largely from the attached medical personnel of the signal battalions. The hospital ceased operating on February 17, 1919.

CAMP HOSPITAL NO. 91^r

Camp Hospital No. 91 was established in October, 1918, at La Boule, Department Loire Inferieure, base section No. 1, by personnel from the American Expeditionary Forces at large. It occupied 5 hotels whose total bed capacity was 800. All of the buildings were modern, electrically lighted, and were suitable for hospital purposes. La Boule is a seaside summer resort and the climate, except during November and December, is delightful; the hospital was used principally as a convalescent home and received patients from base and camp hospitals in base section No. 1. After January 2, 1919, Camp Hospital No. 91 functioned as a centralization point for the Army Nurse Corps under orders to return to the United States. It ceased to receive patients on February 20, 1919, and was officially closed April 30, 1919. The personnel were reassigned to other stations for further duty.

CAMP HOSPITAL NO. 92^u

Camp Hospital No. 92 came into existence October 26, 1918, when the designation of Convalescent Hospital No. 3, at Quiberon, Department Morbihan, base section No. 1, was changed to Camp Hospital No. 92. It occupied 11 summer hotels, with a capacity of 990 beds. Patients received by this hospital were largely convalescent wounded and gassed cases. The institution functioned as a camp hospital until November 18, 1918, on which date its designation was again changed to that of Base Hospital No. 236.

^r The statements of fact appearing herein are based on the "History, Camp Hospital No. 85, A. E. F.," Montoir, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^r The statements of fact appearing herein are based on the "History, Camp Hospital No. 87, A. E. F.," Cour Cheverny, by Maj. A. H. Dunn, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^r The statements of fact appearing herein are based on the "History, Camp Hospital No. 91, A. E. F.," La Boule by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^u The statements of fact appearing herein are based on the "History, Camp Hospital No. 92, A. E. F.," Quiberon, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

CAMP HOSPITAL NO. 93^{*}

Camp Hospital No. 93 was organized October 29, 1918, at Clamecy, Department Nièvre, intermediate section, for the care of patients from the Third Army Corps schools. When first established the hospital was located in three French houses of a total bed capacity of 250. In December, 1918, the French evacuated their Hospital Temporaire No. 3, located in the school for girls, and this building with two barracks in the rear were obtained for Camp Hospital No. 93. The school building, though well equipped, was in a bad state of repair and required considerable renovating before it could satisfactorily be used. During its existence 1,359 surgical and medical cases were admitted. The hospital ceased operating April 15, 1919, and was replaced by the infirmary, Third Army Corps. The personnel returned to the United States by way of Brest, sailing on the *President Grant* May 28, 1919, and were demobilized at Camp Devens, Mass.

CAMP HOSPITAL NO. 94^u

Camp Hospital No. 94 was established in November, 1918, at Aytres, Department Charente Inferieure, base section No. 7, its personnel coming from Camp Hospitals Nos. 88 and 69. It was located in a 2-story wooden barrack, 65-bed capacity, constructed by the 35th United States Engineers, which organization it served. This hospital treated only slightly sick, all cases requiring special attention being transferred to Camp Hospital No. 39, at La Rochelle. Patients were admitted first on December 21, 1918. Two hundred and four were received. From March 8, 1919, to its closing on April 9, 1919, it was used as a venereal disease hospital. Upon its closing, the personnel were reassigned to other stations for further duty.

CAMP HOSPITAL NO. 95^z

Camp Hospital No. 95 was organized in November, 1918, at Verneuil, Department Nièvre, intermediate section, and served the Verneuil area. At the beginning it occupied 3 barracks of about 80-bed capacity; in January, 1919, it moved into a new plant consisting of 7 barracks of 108-bed capacity. The facilities at first were very limited, so medical cases only were kept in the hospital, all surgical cases being transferred to the hospital center at Mars, a distance of about 18 miles. The hospital ceased operating on June 10, 1919; its personnel sailed from St. Nazaire June 27, 1919, on the *Kentuckian*, and were demobilized at Camp Upton, N. Y., July 13, 1919.

^{*} The statements of fact appearing herein are based on the "History, Camp Hospital No. 93, A. E. F.," Clamecy, by Maj. Joseph H. Sayer, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^u The statements of fact appearing herein are based on the "History, Camp Hospital No. 94, A. E. F.," Aytres, by Capt. Hugh B. Sprague, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^z The statements of fact appearing herein are based on the "History, Camp Hospital No. 95, A. E. F.," Verneuil, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

CAMP HOSPITAL NO. 96 ^v

Camp Hospital No. 96 was organized November 4,^e 1918, at Angers, Department Maine et Loire, base section No. 1, its personnel coming from Camp Hospital No. 86. It occupied the Ecole Normale, a three-story school building of masonry construction, well adapted for hospital purposes and capable of accommodating 250 to 300 beds. It did not have any surgical or special service facilities, all cases requiring these being transferred to Base Hospital No. 27, also stationed at Angers. The hospital was established to serve troops in the district of Angers, but with the cessation of hostilities the necessity for this hospital ceased and on January 12, 1919, it was abandoned, and the personnel reassigned to other stations for duty. During the period of its operation it cared for 457 medical cases.

CAMP HOSPITAL NO. 97 ^z

Camp Hospital No. 97 was organized in October, 1918, at St. Dizier, Department Haute Marne, advance section, and was the outgrowth of the American regulating station infirmary at St. Dizier. It was established in several wooden barracks of 106-bed capacity and served the local troops and casualties passing through the regulating station. Patients were received first on November 15, 1918. The hospital ceased to function May 8, 1919; its personnel sailed from St. Nazaire on June 16, 1919, on the *Santa Paula*, and were demobilized at Camp Upton, N. Y., July 6, 1919.

CAMP HOSPITAL NO. 100 ^a

Camp Hospital No. 100 was organized in November, 1918, at Belfort, in the advance section, and was operated by Evacuation Hospital No. 28. It was located in a group of buildings, the Caserne Rathenaus de Belfort, formerly used by a French artillery regiment. The group included 30 large buildings, constructed of reinforced concrete, with tile floors, electric lights, modern plumbing, and steam heat, and accommodated 2,000 patients. The group covered about 12 acres and was surrounded by a high stone wall. This hospital was located close to the Alsace border and received and cared for ex-prisoners of war, both American and British, picking them up at rail ends and transporting them by trucks and ambulances to the hospital. The majority of patients were medical cases; of these 955 were received, including 521 ex-British prisoners. The hospital ceased to operate January 2, 1919, and Evacuation Hospital No. 28 proceeded with all its property to Nantes for duty.

CAMP HOSPITAL NO. 101 ^b

Camp Hospital No. 101 was established in December, 1918, at Auvours, about 8 miles from Le Mans, Department Sarthe, intermediate section, and

^v The statements of fact appearing herein are based on the "History, Camp Hospital No. 96, A. E. F.," Angers, by Maj. W. E. Stewart, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^z The statements of fact appearing herein are based on the "History, Camp Hospital No. 97, A. E. F.," St. Dizier, by Maj. E. L. Martindale, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^a The statements of fact appearing herein are based on the "History, Camp Hospital No. 100, A. E. F.," Belfort, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^b The statements of fact appearing herein are based on the "History, Camp Hospital No. 101, A. E. F.," Auvours, by Maj. Louis J. C. Bailey, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

served the 2d Depot Division. The plant consisted of a number of wooden barracks and tents and was of 1,100-bed capacity. It was operated by the personnel of Evacuation Hospital No. 11. The hospital, with the exception of pneumonia and influenza cases, cared for medical cases of a more or less minor degree. No surgical work was undertaken, all surgical cases and cases requiring special care were transferred to Camp Hospital No. 52, at Le Mans. The largest daily admission was 138 cases; 526 was the greatest number of patients in hospital at any one time. The hospital ceased to operate in June, 1919; its personnel returned to the United States, sailing from St. Nazaire June 29, 1919, on the *Susquehanna* and were demobilized at Camp Dix, N. J., July 17, 1919.

CAMP HOSPITAL NO. 102 ^c

Camp Hospital No. 102 was established on December 18, 1918, at Virelade, Department Gironde, base section No. 2, its personnel coming from the American Expeditionary Forces at large. It was located in the Château Virelade, an unoccupied, large château about 25 miles southeast of Bordeaux, and served the La Brede billeting area, which was occupied successively by the 34th, 40th, 82d, and 78th Divisions. Patients were admitted first on December 18, 1918, and up to April 30, 1919. The hospital received a total of 802 surgical and medical cases. Camp Hospital No. 102 ceased to operate May 16, 1919; its personnel returned to the United States, sailing from Bordeaux on the *Iowan* June 10, 1919.

CAMP HOSPITAL NO. 103 ^d

Camp Hospital No. 103 was established January 14, 1919, at the embarkation camp at Pauillac, Department Gironde, base section No. 2, in a small hospital formerly used by the United States Navy. It consisted of five small stone buildings, each having a capacity of about 49 patients. In addition to the permanent buildings, several wooden barracks were erected, bringing the total capacity of the hospital up to 471 beds. During its existence the hospital cared for 2,153 patients, the majority of whom were medical cases. It ceased to operate May 31, 1919, and its personnel returned to the United States.

CAMP HOSPITAL NO. 104 ^e

Camp Hospital No. 104 was established on February 5, 1919, at Lussac, Department Gironde, base section No. 2, its personnel coming from the American Expeditionary Forces, at large. It was located in the Château Terrien, a partially occupied château about one-half mile north of the village of Lussac. The building contained 30 rooms, 2 inside flush-type toilets, with drains leading into cesspools; a large tank on the third floor, with plumbing in fairly good condition, furnished the château with water. Camp Hospital No. 104 was

^c The statements of fact appearing herein are based on the "History, Camp Hospital No. 102, A. E. F.," Virelade, by Capt. Francis P. Richards, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

^d The statements of fact appearing herein are based on the "History, Camp Hospital No. 103, A. E. F.," Pauillac, by Lieut. Col. M. A. Dailey, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

^e The statements of fact appearing herein are based on the "History, Camp Hospital No. 104, A. E. F.," Lussac, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

established to care for the sick and injured of the Libourne billeting area, occupied by troops awaiting transportation to the United States. The area covered about 16 square miles and the sick were collected by two ambulances making regular morning rounds to infirmaries in the towns of the area. Patients were received first on February 20, 1919, and the hospital functioned until May 2, 1919, on which date all patients were transferred to Bordeaux. The personnel returned to the United States, sailing from Bordeaux on June 10, 1919.

CAMP HOSPITAL NO. 105 ^f

Camp Hospital No. 105, was established February 6, 1919, at Salleboeuf, Department Gironde, base section No. 2, to serve the eastern Bordeaux training area, then occupied by troops awaiting transportation to the United States. It was located in the Château St. Regis, and with the addition of several tents had a capacity of 200 beds. Patients were admitted first on February 11, 1919, and the hospital functioned until April 30, 1919, when all remaining patients were transferred to Base Hospital No. 208 at Bordeaux.

CAMP HOSPITAL NO. 106 ^g

Camp Hospital No. 106 was established February 4, 1919, at Blaye, Department Gironde, base section No. 2, to serve troops in the Bordeaux area. The contiguous area was not occupied and the hospital was closed on May 3, 1919. During its existence only 14 patients were admitted.

CAMP HOSPITAL NO. 107 ^h

Camp Hospital No. 107 came into existence March 1, 1919, when Base Hospital No. 77 at Beaune, Department Côte d'Or, advance section, was designated Camp Hospital No. 107. It was established in the buildings of Base Hospital No. 77 and served the American Expeditionary Force University at Beaune. When taken over, it contained 635 patients. Its capacity was 1,000 which later was reduced to 300. During its existence 813 medical and 394 surgical cases were admitted. The hospital ceased to operate in June, 1919; its personnel returned to the United States, sailing from Brest, June 27, 1919, on the *Manitou*, and were demobilized at Camp Upton, N. Y., July 9, 1919.

CAMP HOSPITAL NO. 108 ⁱ

Camp Hospital No. 108 was organized March 1, 1919, at Allerey, Department Saone et Loire, intermediate section, for the purpose of serving the farm school subpost, American Expeditionary Force University, Allerey. It was organized from the personnel of Base Hospital No. 97 and took over the

^f The statements of fact appearing herein are based on the "History, Camp Hospital No. 105, A. E. F.," Salleboeuf, by Maj. F. H. Hurst, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

^g The statements of fact appearing herein are based on the "History, Camp Hospital No. 106, A. E. F.," Blaye, by Maj. John S. Sweeney, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

^h The statements of fact appearing herein are based on the "History, Camp Hospital No. 107, A. E. F.," Beaune, by the commanding officer of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

ⁱ The statements of fact herein are based on the "History, Camp Hospital No. 108, A. E. F.," Allerey, by Maj. Thomas W. Grayson, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—Ed.

patients and plant of the latter unit. During its two months of operation it admitted 1,306 surgical and medical cases. The hospital ceased to operate May 28, 1919, and its personnel returned to the United States on the *Leriatan*, sailing from Brest June 29, 1919. Demobilization of the unit took place July 12, 1919, at Camp Bowie, Tex.

CAMP HOSPITAL NO. 109 ⁱ

Camp Hospital No. 109 was established February 27, 1919, at Camp Montierchaum, Department Indre, intermediate section, to serve troops in that camp and vicinity. It operated in a group of several barrack-type buildings of 450-bed capacity, and was built on a low flat piece of land directly to the northwest of Camp Montierchaum. For convenience of construction of buildings and general appearance this site was excellent, but the problem of drainage was very difficult. All classes of patients were admitted and cared for. The hospital ceased to operate as a camp hospital on June 12, 1919, on which date its designation was changed to camp infirmary, Camp Montierchaum. The larger portion of the officers and enlisted men were transferred to other organizations for duty, and a skeletonized Camp Hospital No. 109, consisting of 1 officer and 4 enlisted men, was returned to the United States, sailing on the *Madowska*, June 28, 1919, from St. Nazaire, and was demobilized at Camp Jackson, S. C., on July 12, 1919.

CAMP HOSPITAL NO. 110 ^{*}

Camp Hospital No. 110 was established in February, 1919, at La Suze, Department Sarthe, intermediate section, for the care of troops in the Le Mans embarkation center. It was operated by Field Hospital No. 122 and Sanitary Train 106. The hospital occupied 15 wooden barracks and had a normal bed capacity of 350. The site on which the hospital was located was low and drainage was difficult. Because the water supply was unsatisfactory a motorized filtering and treating plant was installed. The hospital ceased to function June 10, 1919; its personnel sailed for the United States from St. Nazaire June 24, 1919, on the *Pocahontas*, and were demobilized at Camp Gordon, Ga., July 8, 1919.

CAMP HOSPITAL NO. 111 [†]

Camp Hospital No. 111 came into existence March 1, 1919, when the personnel of Field Hospital No. 123 was transferred to Solesmes, Department Sarthe, intermediate section, to take over the care of 200 of our patients in the French Hôpital Temporaire No. 38, at that place. Camp Hospital No. 111 occupied four floors in the abbey of the Benedictines at Solesmes. The

ⁱ The statements of fact appearing herein are based on the "History, Camp Hospital No. 109, A. E. F.," Camp Montierchaum, by Maj. Wayne H. Crum, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^{*} The statements of fact appearing herein are based on the "History, Camp Hospital No. 110, A. E. F.," La Suze, by Maj. George A. O'Connell, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

[†] The statements of fact appearing herein are based on the "History, Camp Hospital No. 111, A. E. F.," Solesmes, by Maj. Cornelius F. Holton, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

portion of the building taken over was modern and excellently suited to hospital purposes. The floors were divided into rooms, each room large enough to accommodate five patients. The entire building was well lighted by electricity; heat was furnished by a central heating plant and distributed in all rooms through radiators. The hospital cared for troops in the Sable area, then occupied by the 77th Division; during its operation it cared for 1,538 medical and surgical cases. It ceased to operate May 15, 1919; its personnel were returned to the United States and demobilized at Camp Upton, N. Y., June 30, 1919.

CAMP HOSPITAL NO. 118 ^m

Camp Hospital No. 118 came into existence April 10, 1919, when the Medical Department, United States Army, took over and operated what was until then United States Naval Base Hospital No. 1 at Brest. Camp Hospital No. 118 functioned from April 10, 1919, to August 15, 1919, and during that time admitted 1,301 medical and 500 surgical cases.

CAMP HOSPITAL NO. 120 ⁿ

Camp Hospital No. 120 was established in April, 1919, at Le Mans, Department Sarthe, intermediate section, and served the forwarding camp at that station. The personnel was taken from Mobile Hospital No. 3, when that organization was disbanded on April 4, 1919. The hospital was located in a type A, 500-bed unit, and when first authorized was intended for a base hospital. Admissions to this hospital were very light, as practically all surgical and serious medical cases were transferred to Camp Hospital No. 52 at Le Mans. The hospital was in active operation two months, and during that time it cared for approximately 400 patients. It ceased to function June 11, 1919; its personnel sailed from St. Nazaire July 5, 1919, on the *South Bend* and were demobilized at Camp Gordon, Ga., July 22, 1919.

CAMP HOSPITAL NO. 121 ^o

Camp Hospital No. 121 came into existence June 3, 1919, when American Red Cross Hospital No. 3, at Paris, was taken over by the Army Medical Department, and designated Camp Hospital No. 121. The buildings were situated in very attractive park grounds where also barracks had been erected to house the enlisted personnel. The capacity of the hospital was 200, but the number of patients in hospital never exceeded 130. Approximately 18 per cent of the patients at all times were American welfare workers and officers of the allied armies. Camp Hospital No. 121 ceased to function December 8, 1919; the majority of its personnel were assigned for duty with the Army of occupation, and the remainder returned to the United States.

^m The statements of fact appearing herein are based on the "History, Camp Hospital No. 118, A. E. F.," Brest, by Capt. Otto C. Hirsch, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

ⁿ The statements of fact appearing herein are based on the "History, Camp Hospital No. 120, A. E. F.," Le Mans, by Col. Henry C. Coe, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

^o The statements of fact appearing herein are based on the "History, Camp Hospital No. 121, A. E. F.," Paris, by Maj. L. O. Tarleton, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

CAMP HOSPITAL NO. 122 *

Camp Hospital No. 122 was established April 26, 1919, at Antwerp, Belgium, base section No. 9, to care for our troops in Belgium and Holland. With the exception of small infirmaries in Brussels and Rotterdam, Camp Hospital No. 122 was our only hospital in base section No. 9. It was the last hospital to be established with the American Expeditionary Forces. It was located in a large five-story building that formerly had been a seamen's home and was quite suitable for hospital purposes. It had almost unlimited capacity, but only 350 beds were set up, with same number in reserve. Complete surgical equipment was also on hand. The hospital functioned about 11 weeks, and during that time treated approximately 250 surgical and medical cases. It ceased operating July 16, 1919; its personnel sailed from Brest, August 19, 1919, on the *Troy*, and were demobilized at Camp Devens, Mass., August 24, 1919.

* The statements of fact appearing herein are based on the "History, Camp Hospital No. 122, A. E. F." Antwerp, Belgium, by Maj. William J. Jones, M. C., while on duty as a member of the staff of that hospital. The history is on file in the Historical Division, S. G. O., Washington, D. C.—*Ed.*

SECTION IV

EVACUATION OF PATIENTS TO THE UNITED STATES; DISCONTINUANCE OF HOSPITALS

CHAPTER XXVI

EVACUATION OF PATIENTS TO THE UNITED STATES

Administrative matters concerning the selection of disabled members of the American Expeditionary Forces for return therefrom to the United States, and the transfer of such men from hospitals in the Services of Supply to base ports and thence to suitable transports, were made a responsibility of the hospitalization division of the chief surgeon's officer, A. E. F. As stated in Chapter XIV, Section I, a particular section of this division, namely, the transportation and evacuation section, was devoted to such matters.¹

Early Medical Department plans for the return of the disabled to the United States comprised extensive hospitalization at Savenay, in base section No. 1, in order that selected cases might be collected there and evacuated thence through the port of St. Nazaire; and at Beau Desert, near Bordeaux, for evacuation through the latter place. Owing to the fact that Brest was not considered at the time in the scheme of the return movement, hospital facilities were not provided on a relatively large scale at that place until the latter months of the war.¹

During the first eight or nine months of the existence of the American Expeditionary Forces, cases believed to be suitable for transfer to the United States were relatively few in number, and comprised much the same type of cases as would, in peace time, be considered unfit for further military service.² Such cases were selected initially in the various base hospitals of the American Expeditionary Forces and, usually, transported by hospital train to the base hospitals of the above-mentioned ports. Here the patients were surveyed by a physical disability board; and if found suitable for transfer to the United States, were prepared for the journey there.²

The conditions of actual warfare and the difficulties incident to transporting personnel to France prompted general headquarters, A. E. F., in March, 1918, to depart from our peace-time custom of determining degrees of physical disability.³ In the conduct of the war it was essential that all personnel be utilized to the utmost. Thus, many cases of presumed disability, instead of being returned to the United States, were retained thereafter in the American Expeditionary Forces. The comprehensive order which general headquarters issued on the subject, though it deals with the determination of the physically fit as well as the unfit, is given here practically in full, so far as the present subject is concerned:

The action of a disability board does not require review or approval by higher authority except upon application to the convening authority by the commander of an organization of

which the officer or soldier examined is a member. In this latter case the action of the board will be passed upon by the convening authority, whose action will be final. Reports will be rendered on card form, in duplicate, copies of which will be distributed, one to the statistical section, adjutant general's office, general headquarters, A. E. F., and one to the organization to which the officer or soldier is transferred.

The success of the evacuation service depended in great degree upon the skill of disability boards, which the above quoted order prescribed, in selecting those cases throughout the American Expeditionary Forces which were unfit for further duty but were able to bear transportation both to the base ports and to the United States.² Selection by these boards of cases capable of performing the land journey, but unable to withstand the difficulties incident to the sea trip, led to congestion of the facilities for nontransportable cases at hospitals near the base ports, reduced the elasticity of these hospitals, and limited their embarkation facilities.²

As previously stated, patients in the American Expeditionary Forces in France were embarked at one of the three following ports: Brest, St. Nazaire, and Bordeaux; however, until after the armistice was signed the major portion of them sailed from Brest, due to the fact that this port had the deepest harbor, and in consequence it was to this harbor that our largest ships came with troops from the United States. Since large ships could not dock at Brest, patients had to be placed on improvised lighters and carried on them out to the vessels, frequently in very rough weather. During the period of hostilities, most patients that were embarked at Brest were prepared for transfer to the United States at the hospital center at Savenay,¹ since it was desirable that there be a reservoir of patients from which a suitable number of them could be embarked, without an appreciable loss of time, following notification from shipping authorities that certain ships would be available.²

Promptly after the armistice began, the War Department notified General Pershing that every effort would be made to expedite the early return of the American Expeditionary Forces.³ No necessity now obtained for so rigidly adhering to the principles which prompted the promulgation of General Orders, No. 41, quoted above. Now, not only were all patients classed D to be returned to the United States as soon as their condition would permit, but also all officers and soldiers in hospital who in the opinion of attending surgeons could be safely transported and, in addition, required at least two months' additional treatment.⁵ Exemptions to this general classification included men with contagious⁶ and venereal diseases.⁷ Pertinent parts of the instructions covering the return of the disabled are as follows:

AMERICAN EXPEDITIONARY FORCES,
HEADQUARTERS, SERVICES OF SUPPLY,
France, November 20, 1918.

EMBARKATION INSTRUCTIONS NO. 1

(Personnel to be returned to the United States)

In order to carry out the policy outlined by general headquarters, the following regulations concerning the return of hospital patients and B and C class officers and soldiers to the United States are published.

I

1. All officers and soldiers now in hospitals who will require at least two months' treatment who, in the opinion of the attending surgeons, can safely be transported, and all officers and soldiers who would be evacuated as of class D will, as rapidly as facilities permit, be returned to the United States for continued treatment. The transportation of this class of personnel on hospital trains to designated ports and from thence to hospital ships will be in accordance with regulations to be prescribed by the chief surgeon.

2. All officers and soldiers in hospitals who are evacuated as of class C and all those who are evacuated as of class B, who will require at least two months for restoration to class A, will be returned to the United States in accordance with regulations hereinafter prescribed.

* * * * *

II

Officers and soldiers to be returned to the United States under this order, excluding hospital patients referred to in paragraph 1, section I, shall be sent to depots and rest camps at ports of embarkation, as follows: In the advance and intermediate sections to be sent direct to the 1st Depot Division, St. Aignan-Noyers, for organization and equipment and from thence to the rest camp, St. Nazaire, for transportation to the United States. In the Paris district to be sent direct to base depot, Blois, for organization and equipment, and from thence to rest camp, Brest, for transportation to the United States. In base sections Nos. 4 and 5 to be sent direct to rest camp, Brest, where they will be organized and equipped and returned to the United States. In base section No. 1 to be sent direct to rest camp, St. Nazaire, for organization, equipment, and shipment. In base sections 2, 6, and 7 to be sent to rest camp, Bordeaux, for organization, equipment, and shipment.

III. ORGANIZATION AND EQUIPMENT

1. All soldiers, upon arrival at the 1st Depot Division, at the base depot, Blois, or at a rest camp at a base port, if sent directly there, shall be organized into casual companies consisting of 2 officers and 150 enlisted men per company, the necessary medical attendants (class B or C, if available), and medical supplies to accompany each company or group of companies. White and colored troops to be organized separately. Such companies to be serially numbered, with the added designation of the depot or rest camp at which the company is organized. To avoid duplication of numbers assignment is made in blocks, as follows: "Bordeaux Casual Companies Nos. 1 to 100"; "St. Nazaire Casual Companies Nos. 101 to 200"; "Brest Casual Companies Nos. 201 to 300"; "Blois Casual Companies Nos. 301 to 400"; "St. Aignan Casual Companies Nos. 401 to 500." When a block is exhausted at any camp a new series will be started by adding 500 to the initial number of the previous series; for example, Bordeaux's second series of numbers will be 501 to 600.

2. Each company will be physically examined for contagious diseases and deloused at the depot or rest camp at which it is organized, and the commanding officer of the organization will be furnished with a certificate showing its serial number and other designation and the fact that each member has been thoroughly deloused and is free from contagious disease. The proper sanitary inspection will also be made at base ports prior to embarkation.

3. When a company is organized each soldier will be provided with a neat and well-fitting uniform and serviceable equipment * * *.

IV. DISPOSITION OF RECORDS

1. It is of the utmost importance that each soldier returned to the United States under this order shall be accompanied by his qualification card, service record, all war-risk papers pay card individual pay record book, and individual equipment record; and also that each officer takes with him his original qualification card securely wrapped and sealed, his identity card, and, if a captain or of lower rank, his officer's record book.

2. Commanding officers of hospitals will, upon the evacuation of B or C class personnel under this order, send immediate telegraphic notice, as far in advance of evacuation as possible; in the case of officers, to the statistical division, adjutant general's office, general head-

quarters, and in the case of soldiers, to the central records office, Bourges, stating the name, rank, serial number, former organization, together with the depot or rest camp to which the records are to be sent.

3. In the case of class B or C personnel on duty in the American Expeditionary Forces affected by this order, the commanding officer forwarding such personnel will be held responsible that the proper records accompany them to the depot or rest camp to which sent.

4. Courier service will be established between the central records office and the two depots and the three rest camps at which casualties and organizations are prepared for embarkation, for the purpose of the prompt procurement of records. In the event that the central records office is unable to furnish the required records, all data available, including the statement that the records can not be obtained, will be forwarded with the organization with which the soldier sails. The commanding officer of the rest camp shall furnish the central records office with a list of enlisted men departing for the United States without their individual records, showing the organization to which they belonged. The central records office will forward such records as soon as obtained to The Adjutant General, Washington, D. C.

5. In the case of officers and soldiers sent direct to the United States as hospital cases, as provided in paragraph 1, section I, of this order, telegraphic notice shall be sent as above, stating the port at which the patients are to be embarked and directing that the records be sent there, addressed to the commanding officer of the base hospital at the port of embarkation, and plainly marked, "Records of hospital cases." The embarkation of hospital patients shall not be delayed by reason of the failure to obtain the individual records. Every effort shall be made, however, to obtain them in every case, as required by existing orders. The evacuating hospital at port of embarkation will furnish the central records office with lists of men returned to the United States without their records, by courier, accompanied by any records received too late to go with the patient.

V. REPORTS

The commanding generals of base depot, Blois, and the 1st Depot Division will send telegraphic notification to the rest camp which they feed, immediately upon the departure of an organization, giving the following information:

- (a) Designation of organization.
- (b) Date and hour of departure.
- (c) Number of officers.
- (d) Number of soldiers.

A duplicate of this telegram will be sent to the commanding general, Services of Supply (G-1).

VI. GENERAL INSTRUCTIONS

1. Class B and C personnel of the Marine Corps will be organized into provisional companies composed entirely of Marine Corps officers and soldiers. No attempt will be made to segregate marines with reference to the geographical area from which they were recruited in the United States.

2. Whenever casualties in sufficient numbers come from the same sections of the United States, they will be formed into companies according to localities, in order that they may be sent to the cantonment or camp nearest the place from which they entered the service. This will not apply to hospital evacuations.

3. The commanding general, base section No. 3, will make necessary arrangements for the return to the United States of hospital patients and class B and C personnel through English ports and rest camps, in accordance with special instructions issued from these headquarters.

4. The provisions of this bulletin do not apply to base section No. 8, concerning which special arrangements will be made.

By command of Major General Harbord:

W. D. CONNOR, *Chief of Staff.*

Official:

L. H. BASH, *Adjutant General.*

Embarkation Instructions No. 4, headquarters, Services of Supply, November 25, 1918, required that commanding officers of casual companies organized for embarkation would be held responsible that the records of both officers and enlisted men were completed. If a service record was not at hand or was not procurable at the central records office, a supplementary record was to be prepared from the best available data, usually consisting of information from the soldier.

The effect of Embarkation Instructions No. 4 was to delay the evacuation of patients, even more so from England than from France, since those of our men who had been serving with the British, as in the American Second Corps, and were evacuated through British hospitals after injury, often had their records lost or delayed in transit. After the order above mentioned was published, the commanding general of our troops in England estimated that only 4 per cent of the records pertaining to our sick and wounded there were obtainable, that many of these patients were selected and ready for embarkation, and that ships were at the docks, with adequate space for the patients.²

It was now necessary to decide whether the best interests of the patients would be served by prompt embarkation or their retention until service records became available.² If looked at solely from the standpoint of evacuation, it mattered relatively little whether or not the incapacitated were accompanied by service records; however, the difficulties of properly disposing of patients in the United States after their arrival there precluded the possibility of disregarding the necessity for service records accompanying the patients. Therefore, subsequent promulgations dealing with the evacuation of sick and wounded from France took into consideration not only the necessity for facilitating the embarkation of patients, but also the great need for having service records accompany patients so embarked.

In the early part of January, 1919, revised instructions concerning the evacuation of sick and wounded from the American Expeditionary Forces were issued by headquarters, Services of Supply.⁸ These instructions contained not only much that former embarkation instructions included, but also details that would further insure the ready and accurate identification of each patient so evacuated. That part which has present pertinence is as follows:

II. (1) All officers and soldiers in hospitals who will require at least two months' treatment and who, in the opinion of the attendant surgeons, can safely be transported, and all officers and soldiers who would be evacuated as of class D, will, as rapidly as facilities permit, be returned to the United States for continued treatment. The transportation of this class of personnel on hospital trains to designated ports and from thence to hospital ships will be in accordance with regulations to be prescribed by the chief surgeon.

(2) In accordance with detailed instructions to be issued by the chief surgeon, convalescent or ambulant patients who require no special accommodations evacuated on any transport will be organized into one or more detachments, each not exceeding 150 men, and under command of an officer, to be selected wherever practicable from casual medical officers, convalescents, or B or C class personnel. These detachments will be numbered serially, beginning with No. 1 at each port of embarkation, as follows: (Convalescent Detachment No. —, Bordeaux). The destination of the detachments to which these men are assigned will be entered on the passenger lists, hospital records, and on the service record that is forwarded with the soldier. The officer in command of each detachment is charged with the duties outlined in Section I, paragraph 7.

On each transport carrying sick and wounded not organized into casual detachments, as above indicated, a medical officer will be put in charge of the sick and wounded, and such officer will be charged with the duties outlined in Section I, paragraph 7. On naval transports the duties of this officer will be discharged after consultation and in full accord with the naval authorities.

To insure accurate identification, in addition to proper notations on the passenger lists and hospital records, the sailing number of the transport will be entered, in each case, on the service records of all sick and wounded not organized into casual detachments.

(3) Commanding officers of hospitals will, upon evacuation of officers, send immediate telegraphic notice, as far in advance of evacuation as possible, to the statistical division, adjutant general's office, at general headquarters, stating their name, rank, and organization, together with the hospital, depot, or embarkation camp to which their records are to be sent.

(4) Daily courier service will be maintained by the postal express service between the central records office and the evacuation hospitals at base sections Nos. 1, 2, and 5, for the purpose of the prompt procurement of records of enlisted men received at these hospitals without them. Requests submitted by this courier system (and those submitted as outlined in Section III, par. 4) will be given preference by the central records office. In the event that the central records office is unable to furnish the required records, all data available, including statement from the central records office that the records can not be furnished by that office, will be forwarded with the organization with which the soldier sails. When records can not be obtained, steps should be taken to provide supplementary records and payments as outlined in Section I, paragraph 10. The commanding officers of such hospitals are charged with arranging for the payment of all patients prior to evacuation. The evacuation hospitals at ports of embarkation will furnish the central records office, by courier, with a list of names of men returned to the United States without their records, showing the organizations to which the men belong. (Notation in red ink under man's name on passenger list furnished central records office may be used in lieu of list.) The central records office will forward such records, as soon as obtained, to The Adjutant General, Washington, D. C. Records received too late to accompany hospital patients will be forwarded by base port personnel adjutant to The Adjutant General's office, Washington, D. C., with a letter of transmittal, giving the organization to which the men belong and the name of the boat on which they sailed; a copy of this letter will be sent by courier to the central records office.

On January 5, 1919, general orders were promulgated by general headquarters, A. E. F., prescribing that all soldiers in hospitals, classified for return to the United States under the provisions outlined above, with the exception of class D patients, were to be transferred to specified overseas casual camps.⁹ Patients classed D were to be transferred to hospitals at Savenay, Bordeaux, or Brest, and carried on casual rolls. Prior to embarkation all soldiers were to be transferred from casual camp or hospital to a properly numbered casual company, convalescent detachment, or sailing convoy for transportation to the United States.⁹ Soldiers selected for transfer to the United States were to be dropped from the rolls of their organizations, and the service records of these soldiers were required, when obtainable, to be completed by the hospital commander, and to accompany the men upon transfer.

On February 2, 1919, further instructions were issued by general headquarters, A. E. F.,¹⁰ to the effect that officers and soldiers admitted to hospital would not be dropped from the rolls of their organizations, except when the hospital to which the officers or soldiers were admitted was not in the vicinity of the organization, thus precluding the organization from carrying the patients concerned as present sick. In the event it was necessary to drop patients in hospital from the rolls of their organizations (for example, when the hospital

was not in the vicinity of the organization or when patients carried present sick by organizations were selected for transfer to some other hospital), commanding officers of organizations, upon proper notification, furnished commanding officers of hospitals with the service records of the men concerned. Commanding officers of hospitals were directed to make proper notations on the service records of men evacuated. Service records were to accompany men when evacuated.

EVACUATION OF SICK AND WOUNDED FROM THE PORT OF ST. NAZAIRE, BASE
SECTION NO. 1

DURING THE PERIOD OF HOSTILITIES

In the evacuation of sick and wounded from the port of St. Nazaire the factors always to be considered were comfort to the patients, and at the same time as much speed as possible.¹¹ The element of speed was made necessary by the fact that the arrival of vessels invariably was kept secret until the last few hours before arrival. Then, as a rule, only tentative arrangements could be made, for a great deal depended on the size and the number of the transports.

At this port there were adequate docking facilities, so that each ship usually found a berth alongside a dock.¹¹ Thus little trouble was experienced in loading of the disabled.

As soon as the base surgeon's office received news of the expected arrival of a convoy the hospital center at Savenay, the main center of evacuation of class D patients, was notified, and the names of the ships were given if known.¹¹ In this way tentative plans could be made, for by referring to a list provided by the Navy Medical Department the number of patients of each type capable of being loaded aboard each of the ships could be calculated. It now remained to find out from the Transport Service the most convenient time for loading the transports and the docks to which they were to be moored.

The passenger lists were made out at Base Hospital No. 8 under the following headings:¹¹

[illegible]

A medium-sized transport could carry 50 bed cases, 500 walking cases, and 30 to 40 officers of either type.¹¹ If mental cases were to be sent, the number was usually about 35, 1 attendant being required for every 8 mental cases. In order to further facilitate matters, a naval representative proceeded to Base Hospital No. 8 for the purpose of tagging each patient, designating the compartment of the ship, if possible, and showing a serial number corresponding to that on the passenger list.

Choosing patients fit to travel and whose records were complete was a duty of the base hospital.¹¹ The passenger lists were made out there also,

and, based on the total number of patients, blankets (three per man) and mess kits were drawn and placed aboard the hospital train. If the patients were destined to return home on a hospital ship, no mess gear or blankets were required, the ship being amply supplied with these essentials.

The loading of the hospital train was in charge of the evacuation officer.¹¹ In addition to seeing that the proper patients were placed aboard, it was his duty to see that each man was tagged, had his medical envelope attached to his clothing, and had his blankets and mess kit, and that the lists of patients and the records were delivered to the commanding officer of the train. On occasions it became necessary for the evacuation officer to accompany the patients to the base port. In this event he in person turned over to the detraining officer the records of the patients and the passenger lists. If the evacuation officer did not board the train, the above-mentioned records and equipment were turned over to the commanding officer of the train.

When the loading of the train was well under way, the evacuating officer notified the railway transport officer, who arranged a schedule for the train over the French railroad.¹¹ On this particular division a schedule was usually possible every 20 minutes. Thus the time of the departure of the train could be anticipated almost to the minute. The train having left the sidetrack running up to the hospital, the commanding officer of the hospital or his adjutant notified the base surgeon, whose office was in the city (St. Nazaire) in which the detraining and embarkation occurred.

From the base surgeon's office the various auxiliary departments were called on the telephone.¹¹ The naval liaison officer was notified; also, the officer in charge of the ambulance battalion was notified of the probable time of arrival of the train, and was instructed as to what kind and how much equipment to bring with him. The detraining officer was notified. In this way all was in readiness when the train backed into the railroad yards, the ambulances were lined up beside the track, the detraining officer was on hand, and the necessary arrangements were made aboard the ship to be loaded. It may be well to state here that it was customary to load but one boat at a time.¹¹ This avoided confusion and misplacing patients and records.

The detraining officer boarded the staff car, procured the passenger lists and records, and signed receipt for mess kits and blankets.¹¹ He then ascertained the position in the trains of the cars containing the various types of patients. As a rule, the walking cases were kept in cars by themselves, the bedridden in other cars, and the officers and nurses, if any, in still another section. Having obtained this information, he planned the method of unloading accordingly and gave instructions to the commanding officer of the ambulance convoy. These instructions varied with each evacuation, for there were several factors to be considered. Among these factors were: (a) The type of train (if American, the bunks and beddings were fixtures on the train; if French, the men were lying on litters in racks of three tiers, covered with blankets, the property of the train); (b) the relative proportion of the litter and walking cases; (c) the position in the train of patients of each group; (d) the time of day and the weather.

In the case of an American hospital train it proved best to have on hand a large extra supply of blankets and litters, for none of the train's equipment

could very readily be used.¹¹ The extra supplies, carried in small motor trucks, kept up with the ambulances as they unloaded first one car and then another. By keeping the two types of machines abreast, patients with extension apparatus too long or too awkward for the small Ford machine could be placed in a G. M. C. Furthermore, when things were running smoothly the detail easily could load two ambulances at once at each of the several train doors. Seldom more than two cars could be worked at one and the same time, for to do this 13 men were required at each car, 4 to handle the litters in the car, 8 outside, and a noncommissioned officer to direct in case of the temporary absence of one of the officers. Then, too, too much speed at the train congested loading at the ship, since the checking required some time, and the litter bearers could progress with only moderate rapidity in the narrow passageways and up the steep stairways. They might further be detained by having to wait some time for the patients to be transferred from litter to bunk. In order not to lose property, it was the rule for each pair of men to return with the litter on which they carried their patient aboard. In order not to lose time, sitting or walking patients were transferred in G. M. C.'s Fords, and even in motor lorries, during the time the litter cases were being handled. Therefore there were no idle vehicles. The detraining officer proceeded by first ambulance to the transports, carrying records and passenger lists, so that checking might begin the moment the first patient arrived.

PROCEDURE DURING THE ARMISTICE

The signature of the armistice, on the 11th of November, marked the turning point with respect to the policy of evacuation of the sick and wounded of the American Expeditionary Forces. The secrecy surrounding arrivals and departures of ships and the haste required in loading them no longer obtained. Every effort was made to keep the proper authorities advised of the expected arrival of transports, and once they arrived, due consideration could be paid to the comfort of the patients—speed was not the important factor that it had been.¹¹

On November 25, 1918, the work of the evacuation of patients to the United States from base section No. 1 was officially placed under the base commander by the following letter from the commanding general, Services of Supply:

AMERICAN EXPEDITIONARY FORCES,
HEADQUARTERS SERVICES OF SUPPLY,
FIRST SECTION, GENERAL STAFF,
November 25, 1918.

From: Commanding general.

To: C. O., base section No. 1; C. G., base section No. 2; C. G., base section No. 5.

Subject: Evacuation service.

* * * * *

2. The responsibility for the evacuation of personnel to transports is vested in base section commanders, and the details will normally be executed through their staffs. Naval medical liaison officers have been detailed to duty at ports of embarkation, and the utilization of the services of these officers along the lines indicated in this correspondence should materially assist these staff officers in handling this important work.

By order of the C. G.

J. B. CAVANAUGH,
Assistant Chief of Staff, G-1.

On December 2, 1918, additional instructions were given by the chief surgeon, A. E. F., in the following letter, and three hospital trains were assigned permanently to the section for the transportation of sick and wounded between hospitals of the section and from hospitals to transports:

AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON, A. P. O. No. 717,
December 2, 1918.

From: Chief surgeon.

To: Surgeon base section No. 1

Subject: Evacuation of patients to the United States.

1. The chief surgeon desires that you assume charge of the evacuation of all patients selected for transfer to the United States from the hospital centers, Angers, Nantes, Savenay, and St. Nazaire. When such patients are selected at these hospitals, use the hospital trains 50 and 51, now assigned to you, to collect them at Savenay for final scrutiny, assembly of records and equipment, with clothing, blankets, mess kit, and toilet articles.

2. It is very essential that improper cases for transfer to the United States be not all assembled at Savenay, resulting in congestion of nontransportable cases there, so that you are advised to have the cases which are moved from Angers and Nantes selected from those able to bear the journey to the United States. Also, take advantage of the fact that men discharged from hospitals of classes B and C who are able to join casual companies may be sent to the casual concentration camp at St. Nazaire.

3. Keep this office informed of your needs in the way of personnel, transportation, supplies, and equipment, in order that the deficiencies may be promptly met. A copy of this letter has been sent to the commanding officer, hospital centers, Angers, Nantes, Savenay, and Base Hospital No. 101, St. Nazaire.

By direction:

R. M. CULLER, *Colonel, Medical Corps.*

When this port was designated as one of the three principal ports of embarkation, plans immediately were made to cope with the situation, and in the medical, as well as in all the other departments, an evacuation branch was inaugurated. "The general system used previously was not materially changed. However, instead of relying upon casual organizations at the rest camp to furnish details of litter bearers and ambulance drivers, an ambulance company was assigned to the duty. Soon it was found that in addition an evacuation ambulance company and a field hospital unit could be used, the three organizations working as a battalion."

Furthermore, the regulating branch in the office of the base surgeon took on added responsibilities, and in order to systematize and standardize the reports required by the different departments several mimeographed forms were promulgated.

The following circular letter was sent to all base hospitals and camp hospitals, hospital centers and convalescent camps in Base Section No. 1:

SERVICES OF SUPPLY,
OFFICE OF THE SURGEON, BASE SECTION NO. 1,
France, November 21, 1918,

Circular Letter A-16.

From: The surgeon.

To: The commanding officer.

Subject: Report of patients to be evacuated to the United States.

1. In order to facilitate the evacuation of patients to the United States, it is requested that you submit daily telegraphic or telephonic report to this office giving the following information by numbers of patients in your hospital ready to be evacuated to the United States:

- (1) Stretcher cases in sick bay.
 - (2) Requiring dressings, in standees.
 - (3) Requiring no dressings:
 - (a) Requiring help.
 - (b) Not requiring help.
 - (4) Tuberculosis.
 - (5) Mental.
2. The report should reach this office by 10 a.m., daily.
 3. Report should be made as given in the form below:

BASE SURGEON, *St. Nazaire:*

Base Hospital twenty seven November twenty second re circular letter A sixteen one
133 two 145 three A231 B 452 four 99 five 63.

SMITH.
CHAS. L. FOSTER.

CHAS. L. FOSTER,
Colonel, Medical Corps, United States Army.

This report enabled the base surgeon to keep constantly on hand such data as the total number of class D patients in the base section, the total number of litter patients, tuberculosis, mental, and other groups.¹¹ As soon as these data were received they were tabulated, so that at the end of each day it was possible to tell in a moment how many class D patients were in the section, how many at a particular hospital, which hospital was overcrowded, and which one needed first consideration when an opportunity to evacuate presented.

A "Capacity and adaptability report" was made up as follows:¹¹

[illegible]

This report was a great help also in that it covered all the essential points with respect to a transport's fitness to receive patients.¹¹ It was designed with the concurrence of the naval medical representative, and was used by him, and by the Army medical officer assigned to the duty of passing judgment upon arriving transports. Upon receipt of this form the data were transcribed to permanent records in the office of the surgeon, where they were available for ready reference when the ship returned to this port. A copy of the report was sent to the hospital center at Savenay, where it was used in preparing the passenger lists. In order not to delay matters, however, the data usually were read over the telephone to the commanding officer of the hospital center, and the report sent as confirmation.

A "space" report was used in connection with all transports, and was sent by courier to the evacuation officer at the evacuation camp, base section No. 1, and to the superintendent, Army Transport Service.¹¹ Thus, if for any reason any part of a ship could not be utilized by the Medical Department, it could be utilized in returning to the United States such casual and class B and C officers and men as might be awaiting transportation.

The following "Evacuation report" was rendered to the chief surgeon, A. E. F., for each ship loaded with patients for transportation to the United States:¹¹

1. The following is list of patients evacuated from this port, above date, aboard

----- (Name of transport.)	
	MEDICAL
Tuberculosis-----	
Mental:-----	
Restraint-----	
Others-----	
All other sick-----	
Total sick-----	
Sitting cases-----	
Litter cases-----	
	SURGICAL
General surgical-----	
Fractures, upper extremities-----	
Fractures, femurs-----	
Other fractures-----	
Total fractures-----	
Sitting-----	
Litter-----	
Grand total-----	

This report was made instead of the lengthy one required by paragraph 4-F, Circular No. 38, chief surgeon's office, July 1, 1918, and was rendered in the case of all sailings subsequent to December 1, 1918, to comply with letter, chief surgeon's office, dated November 22, 1918, quoted above.¹¹ One copy of this report was sent to the commanding officer, base section No. 1, and one copy was held for file, the essential data being tabulated upon a permanent form in the office of the base surgeon, for ready reference.¹¹

Other reports, occasionally required, were readily compiled from the data obtained in the manner outlined above.¹¹ Thus a memorandum to the chief surgeon's office was sent from the office of the base surgeon each week end, of the total number of class D patients remaining in the section.¹¹ At the end of the month, a letter covering the total number of patients of each class evacuated to the United States was forwarded to the chief surgeon, A. E. F., and copies were sent to the commanding officer, base section No. 1, and to the naval liaison officer.¹¹

The following extract from the Annual Report of Surgeon General, United States Navy, 1919, concerns the part played by the Navy in the return of sick and wounded from the American Expeditionary Forces:

At a very early stage of the war arose the problem of how to return the sick and wounded to America. The ideal solution would have been for the Army to return its casualties in ambulance ships owned, manned, and equipped by its Medical Department and conveyed by the Navy. This was impossible, and the next measure considered was the use of the Navy hospital ship *Solace*, with its capacity for returning 200 casualties a month, and the use later of two other hospital ships in process of equipment able to bring back 300 sick apiece per month. The Army's estimate of a minimum of 5,000 returnable casualties per month showed

these resources to be utterly inadequate even had these three vessels not been required for their original and legitimate purpose of caring for the Navy sick. Out of this situation developed the arrangement by which all Navy transports would, on the westward passage, serve to the limit of capacity for the return of Army sick and wounded, and a schedule of each ship's carrying capacity was forthwith gotten up and generally promulgated for the guidance of all concerned. This proved the best arrangement possible under the circumstances and was entirely satisfactory whenever the limit of a given ship's capacity was not exceeded. Unfortunately it was not always sufficiently clear that the complement of a troop ship bound east by no means corresponded to its capacity for adequate care of returning sick and wounded. The pressure at evacuation centers in France was, of course, enormous and it extended to ports of embarkation, but the Navy took the position from the start that what was good enough for healthy men being rushed to the front was by no means sufficient for the maimed and sick who had done their bit and were entitled to the best possible care and professional attention the moment their retrograde movement began. To subject the sick to the overcrowding of troop compartments for a 10-day voyage was to jeopardize their chances of recovery. The troop quarters, with their three and four tiers of standee bunks, on iron decks remote from mess room, toilet, and open-air recreation were absolutely out of the question for the lame and disabled, the bedridden, the surgical cases requiring one or many daily dressings and, of course, during the period of the submarine menace common humanity demanded that the number of totally disabled and helpless passengers be not out of proportion to the facilities for carrying them to and caring for them in rafts and lifeboats should "abandon ship" be necessary. The captain of the ship and the senior naval medical officer were judged by the Navy Department to have sufficient appreciation of the need for rapid evacuation, combined with a practical knowledge of conditions at sea, to determine not the maximum carrying power but the maximum of facilities approximating the required hospital service for sick and wounded on each ship. The much talked of "hommes 40, chevaux 8" car was not esteemed an appropriate means of transfer rearward for the disabled ashore, and it was not proposed to give them an analogous service on a 1-day voyage on the water.

Had it been only a question of attendant personnel, the whole matter would have been much simplified, but the humane treatment of the returning casualties included a variety of other considerations. There was a limit to the number of attendants that could work in confined ship spaces without falling over each other, especially when the ship was darkened in the submarine zone. The proper handling of contagious cases, the tuberculous, the insane, involved nice adaptation of numbers and special requirements to available space and facilities.

Conferences of the bureaus concerned, beginning November, 1917, led to the drawing up of a formal agreement by which the Navy undertook to handle all sick and wounded for which it could provide adequate space, the prime basis of adequate treatment, on troopships manned by the Navy, and to furnish the services of its three hospital ships in excess of its own needs only.

In their joint report of February 7, 1918, to you, the Surgeon Generals of the two services agreed that the Navy hospital ships were entirely unavailable for Army purposes as sick transports, their capacity being small and their services completely utilized with mobile units of the fleet. The Navy transports were agreed upon as the best available means of returning Army sick and wounded, the number to be carried being limited to available space after the Navy sick and the sick of the troops in transit had been provided for. There was also a joint recommendation for the purvey of six ambulance ships, of 500 or more capacity, for Army use.

Your letter of January 22, 1918, to the honorable Secretary of War definitely assigned to Army use the facilities for handling Army sick and wounded returning to the United States available on Navy transports then in service and of others that might be subsequently obtained, and the two Navy hospital ships *Comfort* and *Mercy* were also offered when the services of these vessels could be spared from naval use. It was stated that no increase in facilities for this purpose were contemplated by the Navy, but that, should the Army find these repatriation provisions insufficient, naval personnel would be provided to man and operate such vessels as the Army might procure. The substance of this letter was reiterated in your letter of January 29. Again, in your letter of February 15 to the honorable Secretary of War, it was clearly pointed out that the Navy would man and operate any number of hospital ships provided by the Army, said ships to be ready in all respects for occupation.

The following was the agreement approved by yourself and the honorable Secretary of War, March 28, 1918:

(a) That the sick and wounded being brought from France or England to the United States will be brought in naval hospital ships or transports, whichever may be most suitable and available, except in special cases where transportation by commercial liners may be authorized.

(b) The Army will be in charge of the embarkation and disembarkation of all Army patients.

(c) The Navy will be charged with the care of these patients while on board ships of the Navy acting as transports or otherwise.

(d) At the request of the Navy, the Army will render such assistance in personnel and matériel as may be necessary.

The following schedule shows the classified sick-carrying capacity of the great majority of the transports in service on December 1, 1918. The figures fluctuated more or less with alterations in internal structural details made for better ventilation or other sanitary considerations. On some transports increased passenger service went hand in hand with improved disposition of living spaces; in others, it was reduced. In every case, the numbers of different types that could be treated with gratifying results depended absolutely on the type and general structure of the ship, which, in the main, was fixed and not susceptible of modification.

Revised table for rated capacity for troops invalided home September 5, 1918, on principal naval transports

	Total bed- ridden in sick- bay bunks	Able to walk, re- quiring surgical dress- ings; in troop standees	Mental cases	Tuber- culosis, in isola- tion or on open decks	Able to walk, re- quiring no at- tention; in rooms for officers	Conva- lescent, requir- ing no special atten- tion; in troop standees
Aeolus.....	24	100	10	30	145	2,580
Agamemnon.....	38	130	20	60	230	3,000
America.....	59	140	12	25	215	3,600
Antigone.....	40	110	5	25	100	1,660
Calamares.....	42	100	5	20	80	1,100
De Kalb.....	12	150	—	20	50	1,000
Finland.....	40	200	6	30	150	3,350
George Washington.....	60	500	8	50	500	4,600
Great Northern.....	40	400	45	38	116	2,200
Hancock.....	20	550	3	—	40	* 750
Harrisburg.....	38	200	5	25	100	2,200
Henderson.....	50	350	8	16	64	1,164
Huron.....	38	110	5	25	140	2,250
Konigen der Nederlanden.....	24	300	2	30	80	1,500
Kroonland.....	40	200	16	20	150	2,600
Leviathan.....	100	1,000	360	55	400	1,000
Lenape.....	20	100	—	10	44	1,000
Louisville.....	45	300	5	30	100	1,800
Madawaska.....	40	100	5	25	105	1,750
Mallory.....	20	100	—	10	40	1,200
Manchuria.....	38	300	22	40	175	2,850
Martha Washington.....	50	150	25	30	100	2,250
Matsonia.....	16	100	5	10	90	2,000
Maui.....	30	100	5	10	100	2,000
Mercury.....	44	110	20	25	120	2,300
Mongolia.....	33	300	5	25	170	2,850
Mount Vernon.....	40	130	25	25	140	1,800
Northern Pacific.....	44	510	45	90	120	1,700
Orizaba.....	40	500	—	25	90	2,000
Pastores.....	25	100	—	15	50	1,000
Plattsburg.....	38	200	10	45	100	2,000
Pocahontas.....	39	120	5	25	130	2,180
Powhatan.....	40	300	10	25-150	57	1,400
President Grant.....	55	110	5	25	200	4,400
Princess Matoika.....	35	150	5	16	150	3,000
Rijndam.....	50	1,000	10	40	155	1,800
Siboney.....	50	500	—	25	90	2,000
Sierra.....	30	200	5	25	100	1,300
Susquehanna.....	45	130	5	25	105	1,850
Tenadores.....	40	100	3	20	42	1,150
Von Steuben.....	—	b 200	—	60	103	* 650
Wilhelmina.....	20	100	5	10	100	1,500
Zeelandia.....	27	500	5	30	76	1,100

* Hammock.

b Cot

DETAILS OF EVACUATION

In July and August the demand for return of sick and wounded to the United States at the hands of embarkation officials in France increased, and pressure was constantly exerted on commanding officers to exceed their allotted complement of sick, notably in the case of the *Kroonland*, *Finland*, and *Calamares*. But whenever sympathy for the congested embarkation areas and for the sufferers in them got the better of the judgment of ships' officers and induced them to exceed the allotted complements the resulting overcrowding led later to complaint about overcrowding in transit. The suggestion was received from various quarters that a ship be modified in structure so as to bring back in same only in large numbers. These suggestions had in view only the evacuation from France of this unfortunate class. They did not extend to a practical consideration of how they would be cared for en masse amid the discomforts and inconveniences of life at sea and the extremely small chance they would have of surviving in the event of attack or disaster to such a ship. Neither was it appreciated by those unfamiliar with the sea that in moments of danger from enemy or stress of weather the presence on board of hundreds of insane would jeopardize the safety of a ship and its complement.

The medical officers and hospital corpsmen of the Navy Transport Service deserve the greatest credit for their faithfulness and skill in the repeated ocean crossings with their sanitary work on the outward, their hospital work on the homeward bound voyage—and the cleaning up, alterations, improvements, constantly going on during brief stays in home ports. This credit has been accorded them by the vast majority of the men to whom they ministered, and the only criticism of the medical aspect of the Navy transport service has arisen when more patients were assigned them than regulations warranted or when men were put aboard unfit or unprepared for the voyage or with misleading diagnoses.

As late as September, 1918, it was necessary to specify, and in December to repeat the request, that at least three hours before sick for return to the United States were sent alongside the transport, its officers should be furnished with quadruplicate lists separate from that of passengers, showing sources of patients, their rank, company, regiment, organization, and diagnosis. Our internal arrangements had long been so perfected that when once this advance information was regularly supplied, the walking patients would be assigned to compartments, the sick to wards, the bedridden carried to beds without a moment's delay, and by the time the ship was well out of the harbor litters were beside each bedridden case, with men detailed as bearers, and provision had been made or instructions given for any exigency that might arise requiring "abandon ship."

Gradually as system and order in the evacuation of the sick and wounded developed all along the line, some of the overwhelming burdens were lightened and at the same time a better service was given. Before the armistice was signed liaison between the two branches of the service was so perfected that some of the early and radical mistakes of evacuation from shore to ship have since been avoided, and it was no longer possible to find one transport returning overloaded while a vastly larger one sailed practically empty from a near-by port. Much of the dissatisfaction with the carrying (adequate caring) capacity of our transports was felt ashore and grew out of methods of coastward routing and distribution of invalid cases in France. This waned as an orderly distribution was evolved based on proper advance information of ships' arrival and the accommodations they afforded.

In transporting the insane our medical officers had to follow the rule of holding to the diagnosis furnished by the medical attendants who had had the cases under observation and study in camps and hospitals ashore prior to embarkation. Every medical man knows the plausible speech and the docile behavior which the most dangerous maniac may assume for even long periods, only to break out in his true light when suspicion has been allayed. The overworked transport surgeon was not in a position to undertake the cure of the insane on an ocean voyage, nor had he the time, even if he pretended to the special skill required, to go into the niceties of differential diagnosis. When patients were no longer sent aboard indiscriminately an hour before sailing, without papers, descriptive lists, or diagnosis, but carefully tagged and sorted as surgical, medical, ambulant, or bedridden, contagious, nervous, and insane, etc., it was his duty to see that the insane were humanely treated, and humanity here

consisted in preventing their jumping overboard or falling down the engine-room hatch, running amuck about the ship, incommoding other patients—in a word, in restraining them and delivering them alive in America. The bulk of the transports were provided with areas inclosed by metal screens, having access to air and light on deck, with a sentry to keep away the thoughtless or inquisitive, and attendants on watch day and night, every sanitary detail being observed in regard to these unfortunates. Passengers who saw unkindness in this restraint or declined to accept the diagnosis made by the Army surgeons conversant with the cases before embarkation were not prepared to accept the responsibility for a different procedure nor could they relieve the ship's surgeon of his. In some cases groups of insane were put aboard our transports under the care of medical officers and attendants detailed for the voyage from the service to which they belonged, and under these circumstances those officers and attendants quartered and handled their charges as they saw fit without the advice or interference of the ship's authorities.

During the most active period of our military campaign the heaviest work of our medical officers on transports flowed from the requirement of surgical cases, many of whom required three or four changes of dressing daily. The most trying work was that of ministering to men sent home to die, a certain proportion of whom, of course, expired within a day or two of sailing.

* * * * *

As our battleships and cruisers are normally provided with facilities for caring for the sick of their crews, estimated at not over 3 per cent for a force of from 600 to 1,000 men on each of these vessels, they were manifestly not adapted in any way nor used for the repatriation of sick and wounded.

Upon the signing of the armistice and with the initial movement for the return of our troops from abroad, steps were taken to utilize certain German ships which had been unable to go to sea owing to the preponderance of allied naval power and were still in German harbors. One of the best of this class was the *Imperator*, which was rapidly converted for transport purposes and, like the rest, was manned by a Navy crew composed in the main of officers and men already abroad and no longer required for campaigning. Other vessels of this category were the *Graf Waldersee*, *Cap Finisterre*, *Kaiserine Augusta Victoria*, *Mobile*, *Patricia*, *Philippines*, *Pretoria*, *Prince Frederick Wilhelm*, *Zeppelin*.

REFERENCES

- (1) Report of the chief surgeon, A. E. F., to the Surgeon General on the activities of the chief surgeon's office, A. E. F., to May 1, 1919. On file, Historical Division, S. G. O.
- (2) Report on the evacuation of sick and wounded, A. E. F., to the United States, undated, made to the Surgeon General by Col. R. M. Culler, M. C. On file, Historical Division, S. G. O.
- (3) G. O. No. 41, G. H. Q., A. E. F., March 14, 1918.
- (4) G. O. No. 206, G. H. Q., A. E. F., November 15, 1918.
- (5) Embarkation Instruction No. 1, Hq. S. O. S., A. E. F., November 20, 1918.
- (6) Embarkation Instruction No. 6, Hq. S. O. S., A. E. F., November 26, 1918.
- (7) G. O. No. 215, G. H. Q., A. E. F., November 25, 1918.
- (8) Embarkation Instruction No. 13, Hq. S. O. S., A. E. F., January 4, 1919.
- (9) G. O. No. 5, G. H. Q., A. E. F., January 5, 1919.
- (10) G. O. No. 23, G. H. Q., A. E. F., February 2, 1919.
- (11) Report on the evacuation of sick and wounded from the port of St. Nazaire, undated, made to the surgeon, base section No. 1, by First Lieut. Edward P. Heller, M. C. On file, Historical Division, S. G. O.

CHAPTER XXVII

DISCONTINUANCE OF HOSPITALS

With the signing of the armistice on November 11, 1918, retrenchment of activities in the American Expeditionary Forces was begun. On that day general headquarters, A. E. F. directed all chiefs of supply services, American Expeditionary Forces, to make immediate reports to the commanding general, Services of Supply, as to what projects and constructive activities had now become nonessential.¹

As a result of these instructions, the commanding general, Services of Supply, on November 14, 1918, directed that the following action would immediately be taken:² Cessation of further procurement, cancellation of such contracts as could be canceled, suspension of construction, stopping of further shipments from the United States of supplies or material already purchased. In addition, each chief of a supply service was directed to study the situation in so far as it pertained to his department and to make further recommendations concerning reductions. That part of this order which affected the hospital situation was as follows:

* * * * *

(a) Provide normal hospitalization on a basis of $7\frac{1}{2}$ per cent of total strength instead of 15 per cent as hitherto.

(b) All contracts for hospital tentage will be canceled.

* * * * *

(d) French contracts for beds and mattresses, mobile hospitals, and mobile surgical units, in excess of the needs of 30 divisions, will be canceled.

* * * * *

(f) The authorization for construction of hospital centers at Evreux, Alencon, Dourdan, and Liffol-le-Grand is canceled.

(g) The authorized increase of 5,000 beds at Rimaucourt is canceled.

(h) Construction work now under way upon the following hospital centers will be stopped: Avoine, La Suze, Montoir, Reignac, and Landerneau. At Beau Desert and Savenay the projects shall be limited to 10 units.

(i) At hospital centers, not above enumerated, all buildings which have been started will be completed.

* * * * *

Because of the many patients in hospital, obviously compliance with some of the above-mentioned instructions could not immediately be carried out; for example, the reduction of the percentage of hospital beds from 15 to $7\frac{1}{2}$ was contingent upon the rapidity with which patients in hospital could either be returned to duty or sent to the United States.³ As a matter of fact, not only did the number of hospital beds increase after the signing of the armistice, but also the number of base hospital units.⁴ Thus, though on November 7 there were 118 base hospitals (or hospitals operating as such) in the American Expeditionary Forces, exclusive of Italy, providing 147,379 normal beds, these numbers were gradually increased until on December 26 there were 127 base hospitals (or hospitals operating as such) with 159,029 normal beds. On the other

hand, emergency beds numbered 83,377 in base hospitals on November 7 (subsequently increased to 86,000), and since these beds were used for the less seriously sick or wounded, and the admission of wounded naturally ceased shortly following the armistice, such beds could be dispensed with fairly rapidly, so that by January 2, 1919, their number had fallen from 86,000 to zero. At this time the number of patients was 93,494.⁴

From this time on the number of base hospitals could progressively be diminished, in that more facilities were provided for transferring patients in them to the United States, and the diminution could keep pace with such transfers. In this connection it is necessary to consider two factors: General instructions for the return of units from the American Expeditionary Forces to the United States, and the selection of units whose services were no longer required.

General instructions affecting the return of organizations to the United States were issued by general headquarters, A. E. F., and by headquarters, Services of Supply; that is to say, general headquarters prescribed in general terms the manner of selecting organizations for return: Troops in the Services of Supply, which included the units of stationary hospitals, were to be returned to the United States in the order in which their services could be spared and, so far as possible, in the order of their arrival in France.⁵ More specific instructions were issued by general headquarters, but these pertained to such matters as embarkation instructions, the transfer and attachment to returning organizations, of excess personnel;⁶ the disposition of property and funds, discharge of officers and enlisted men, etc.⁷ To headquarters, Services of Supply, were left the details of transferring designated units and attached personnel to the United States.

In so far as the selection of hospital units for return to the United States is concerned, as mentioned above, this was contingent upon the use that had to be made of the hospitals. Naturally the movement of hospital units formed but a very small part of the return movement as a whole. Transportation difficulties which obtained during active hostilities still existed, reflecting in the following manner on hospitals in the Services of Supply: Throughout December, 1918, totally inadequate transportation could be secured for the return of men, in hospitals and fit for duty, to their proper organizations, thus leaving in hospital at the end of that month approximately 30,000 men who otherwise should not have been there.⁸ As this would have caused the Medical Department reports to show a relatively high and fictitious morbidity in the American Expeditionary Forces, the chief surgeon, A. E. F., on January 23, 1919, adopted the plan of showing on his daily report of relation of patients to beds, class A patients separate from bona fide patients.⁴

Other factors obtained which influenced the selection of hospital units for return to the United States. These were location, with relationship to lines of communication; whether or not a hospital unit occupied a French building which would be needed for military or other purposes by the French. In Chapter XVI, Section I, which concerns the hospitalization scheme of the American Expeditionary Forces, references are made to the fact that it was necessary for us to go far afield for locations for some of our hospitals; that is, some had to be placed well off our lines of communication, thus making them

not readily accessible. In addition, though some of the places where our hospitals were located proved usable during the period of hostilities, nevertheless, since no sufficient reason existed during the armistice for continuing them, especially if physical characteristics militated against their use, such places were slated early for abandonment. Thus on December 31, 1918, the chief surgeon, A. E. F., reported to the commanding general, Services of Supply, that plans were well under way for the abandonment of the following hospitals in French buildings: ⁸ Base Hospital No. 66, at Neufchateau; No. 23 and No. 36, at Vittel; No. 31 and No. 32, at Contrexeville; No. 20, at Chatel Guyon; No. 30, at Royat; No. 71, at Pau; No. 98, at Lourdes; No. 218, at Poitiers; No. 208, at Autun; No. 63, at Caen; No. 85, at Paris. In addition, it was his plan to abandon the hospital center at Allerey at an early date, because it had been rendered practically useless through the excessive muddiness of the locality.⁸

Aside from the urgent necessity for returning to the French as many as possible of their buildings we had been using as hospitals, the abandonment of hospitals had to be governed to a great extent by their positions on the line of communications; that is to say, though, on the one hand, it was possible to foresee early that certain hospitals could be abandoned, or hospital centers compressed, in the advance and intermediate sections; on the other hand, in the base sections, particularly Nos. 1, 2, and 5, hospitalization not only had to be kept at a pre-armistice status, but also increased to make possible an adequate preparation of the homeward-bound sick and wounded.⁴

The discontinuance of hospitalization then, involved at first principally the advance and intermediate sections.⁴ As to the advance section, on January 1, 1919, there were 29 base hospitals or hospitals acting as such.⁴ There were four principal hospital centers, namely, Toul, Bazoilles, Vittel-Contrexeville, and Rimaucourt. In the changed nature of affairs brought about by the signing of the armistice, some of these continued to be of importance, others did not. Reference was made above to the fact that the Vittel-Contrexeville center was slated for abandonment as soon as its patients could with safety be evacuated to other hospitals. On the other hand, because of the convenient location of the Toul and Bazoilles centers, in so far as the Third Army, and other organizations in the locality, were concerned, these centers remained relatively uncompressed for the first three months of 1919; however, in April, when the number of patients in these centers had materially been reduced, the major portion of their component hospitals ceased operating, and early in May the centers were discontinued.⁴ The Vittel-Contrexeville center was emptied of patients early in February and ceased to operate.⁴ Rimaucourt comprised only five base hospitals at the beginning of 1919.⁴ These were reduced to two by the end of January, to care for the relatively few remaining patients; then to one during the week ending April 24, when the center ceased to exist as such.⁴

During the period January 1 to May 31, 1918, in which the major part of the activities of hospital discontinuance occurred, the number of patients in the advance section diminished from 22,521 to 1,233.⁴ These 1,233 patients were being cared for in five base hospitals located as follows: Commercy, Rimaucourt, Langres, Chaumont, and Dijon.⁴

On January 1 the intermediate section contained 46 base hospitals, most of which were in the following hospital centers: Beaune, Allerey, Mars, Mesves, Vichy, Clermont-Ferrand, Orleans, and Tours.⁴ The principal of these were the first five named. The hospitals as a whole contained 69,802 patients, more than thrice the number in any other one section.⁴ As stated previously, the hospital center at Allerey was not desirable for hospital purposes after the first of the year 1919, consequently by the end of the first week in February it had been reduced in size from seven operating hospitals to one; this remaining base hospital in turn was replaced by camp hospital personnel during the week ending March 6.⁴ A similar experience befell the hospital center at Beaune, except that here an additional week intervened between the conversion of the last base hospital to a camp hospital.⁴ Beaune and Allerey then were used for purposes of the American Expeditionary Forces University.⁹ The hospital centers at Mars and at Mesves were larger than the other centers; in fact, the center at Mesves attained proportions unequalled by any other center in the American Expeditionary Forces.⁴ Both were increased in the number of component base hospital units following the signing of the armistice, Mars to 8 and Mesves to 12.⁴

Both centers continued to operate until May, meanwhile experiencing a gradual compression; so that by April 24, each contained but one operating base hospital.⁴ Mesves ceased to be hospital center during the week ending May 8; Mars several weeks subsequently, due to the fact that its base hospital units, though not operating, were awaiting orders to move to a base port.⁴ The Vichy center comprised five base hospitals, or hospitals operating as such, on January 1, 1919.⁴ These were all in French buildings, principally hotels; hence, despite the fact that the center had developed into a special center for the treatment of head injuries, it was compressed to three hospitals by the middle of January; to one by February 20, and ceased to exist during the week ending March 13.⁴ The Clermont-Ferrand center, being a late development, comprised only four hospitals when the armistice was signed, all in separate localities.⁴ The hospital at Clermont-Ferrand was never operated; the hospital at Le Mont Dore was never used to more than 70 per cent capacity.⁴ At the beginning of the year 1919, these two last-mentioned units had ceased to exist, in so far as the center was concerned.⁴ During January, the patients were evacuated from the remaining two base hospitals of the center, and by the 23d of the month they had ceased to operate.⁴ At the end of May, only two base hospitals were in operation in the intermediate section. These comprised the Tours center, and contained 513 patients.⁴

In the base sections under consideration—that is, Nos. 1, 2, and 5—it was necessary to maintain hospitalization on a relatively large scale until well toward the end of the existence of the American Expeditionary Forces.⁴ Particularly was this true when the hospitals were adjacent to the ports. Where this was not so, as in the case of the centers at Limoges and Perigueux, the hospitals were handled in much the same way as those in the intermediate section; that is, they were compressed, when in centers, and closed when operating independently as rapidly as the evacuation of patients permitted.⁴

On June 16, 1919, only 12 base hospitals remained in operation in the American Expeditionary Forces. These, with their locations, were as follows:¹⁰ Base Hospital No. 57, Paris; No. 65, Kerhuon; No. 88, Savenay; Nos. 113, 118, and 119, Savenay; No. 121, Beau Desert; No. 214, Savenay; 216, Nantes. All but the first four of these had ceased functioning by the end of June; the first four were discontinued in July.¹¹

The gradual reduction in the number of base hospital units in the American Expeditionary Forces was not merely a question of releasing the units when they were no longer needed; on the contrary, a certain amount of shifting of the units was necessary so that those units earliest in France could be released and, at the same time, there would be no interference with the operation of a hospital. This was particularly true of hospitals operating independently. Thus, for example, in January, 1919, Base Hospital No. 6, Bordeaux, was replaced by Base Hospital No. 208; Base Hospital No. 9, at Chateauroux, was replaced by Base Hospital No. 36; Base Hospital No. 27, Angers, was replaced by Base Hospital No. 85.⁴ Also, evacuation hospital units were used to replace base hospital units, to permit the latter units to return early to the United States.⁴

In so far as camp hospitals are concerned, since these were not used for battle casualties, but rather for the temporary care of the sick of troops in their respective localities, the discontinuance of them necessarily was contingent upon the cessation of troop activities; therefore, a given camp hospital had to be kept open until the very last of such activities. There were 56 camp hospitals in the American Expeditionary Forces on January 1, 1919,⁴ and though, on the one hand, it was possible soon to discontinue some of them at different places, on the other hand, it was necessary to establish new ones, for example, at the American embarkation center and at the base ports.⁴ Also, some base hospital activities were taken over by camp hospitals.⁴ Thus the reduction in the total number of camp hospitals in the American Expeditionary Forces was not nearly so rapid as was the case with the base hospitals, and on April 30, 50 camp hospitals remained in operation. However, during the following month, this number was reduced to 29,⁴ and by the middle of June, only 11 existed.^{10 a}

In respect to the actual closing of a hospital, there is no necessity for going into great detail as to this. Suffice it to say that when the chief surgeon, A. E. F., reached the decision that a hospital unit soon could be returned to the United States, he notified the assistant chief of staff, G-4, headquarters, Services of Supply, of that fact, and usually at the same time gave advance notice to the hospital unit concerned.¹² G-4 gave final notice to the unit at the proper time, whereupon the officer commanding the unit, after having accomplished certain administrative matters referred to below, reported to G-1, Services of Supply the fact of the unit's readiness to move in order that this section of the general staff, Services of Supply, charged with the movement of troops, could make proper provisions.¹³ The unit then joined the general movement to the base ports and took its turn in embarking.

^a For details concerning the final disposition of the few remaining camp hospitals, see Sec. VI of this volume.—*Ed.*

Since no medical property was to be returned to the United States,¹⁴ except combat equipment and certain articles including surgical instruments, scientific laboratory equipment, and X-ray equipment,¹⁵ it was necessary for each hospital unit to pack its supplies and equipment with a view of having them stored subsequently in one of the medical supply depots. Circular No. 72, chief surgeon's office, A. E. F., which is given in the appendix to this volume, covers the method that was to be used in preparing equipment for shipment. In view of the inadequacy of space in the medical supply depots and transportation, most supplies pertaining to Services of Supply constructed hospitals remained where they were, ultimately to be turned over to the French.¹⁶ Of course, in so far as those of our hospitals which occupied French buildings are concerned, all supplies and equipment had to be removed.

The disposition of records was as follows: Certain records accompanied the unit to the United States, there to be sent finally to The Adjutant General.¹⁷ These included the correspondence book and document file, morning reports, sick reports, general reports, local orders, war diary. Retained records, such as retained muster rolls, were to be sent to the office of the chief surgeon, A. E. F.¹⁸ In addition the chief surgeon, A. E. F., required each hospital, upon finally closing its work as an organization in the American Expeditionary Forces, to send to his office a final sick and wounded report and the retained register cards (Form 52 M. D.)¹⁸

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SECTION V

THE ARMY OF OCCUPATION IN GERMANY

CHAPTER XXVIII

THE AMERICAN FORCES IN GERMANY

Immediately after the signing of the armistice, the American Third Army,^a was organized as an army of occupation in Germany, in accordance with the armistice terms.¹ The territory assigned to the American Third Army was the historic Moselle Valley from the borders of Luxemburg to the Rhine.¹ The area contained about 1,000,000 people, with only two large towns—Treves, with 45,000 inhabitants, and Coblenz, with 65,000.¹

The maximum number of American troops ever in Germany was in February, 1919, when the number totaled 10,426 officers and 251,833 men.¹ On July 1, 1919, the Third Army had been reduced to 5,095 officers and 100,695 men, and its designation was changed July 2, 1919, to the American forces in Germany.¹ On October 1 the forces consisted of some 510 officers and 10,556 men.¹

MEDICAL SERVICE

Though, as stated above, the change in designation of the Third Army to that of American forces in Germany, was not effected until the summer of 1919, it will be convenient here to consider our medical activities in Germany from the beginning of that year.

The surgeon's office, Third Army, continued to have the same general composition after location of the Third Army in Germany as it had had prior to that event;^b however, a department of sanitation, with much broader interests, was established in the first part of 1919, after the army had been stabilized in the area of occupation.²

As army epidemiologist was attached to the office of the sanitary inspector.² His work was the collection and compilation of data on sickness in the army, the dissemination of this information in the publication of memoranda and a Weekly Health Bulletin, and the formulation of measures for the control of communicable disease. Field work by the epidemiologist was not required, because no extensive outbreak of infectious disease, aside from widespread influenza, occurred.

Territorial sanitation by sanitary squads as army units was not considered necessary after the combat divisions had become stabilized in the areas.² It was decided by headquarters of the army that the divisions with the usual

^a For the composition of the American Third Army and its march into Germany, consult Sec. VII, Vol. VIII, of this history. —Ed.

^b Consult Vol. VIII, Sec. VII, Chap. XXXVIII, for details concerning the composition of the office of the surgeon, Third Army.

divisional medical personnel would be able to carry on continuous sanitary work in their permanent areas without the assistance of a separate army sanitary force. This plan proved satisfactory and, as records of sanitary conditions in the various areas were kept in the office of the army sanitary inspector, no difficulty was experienced in furnishing incoming divisions with the essential information regarding the sanitary conditions of the areas which they were entering.²

In the area of occupation about 10 per cent of the troops were quartered in barracks, while about 90 per cent were billeted with civilians in cities and villages.² The civil sanitary arrangements varied from crude, primitive methods of water supply and refuse disposal to the fairly well organized sanitary systems of the larger cities. The number of soldiers in this area, at first approximately 250,000, practically doubled the population.² So severely did this increased density of population tax the general living arrangements, water supplies, and conservancy system, that a considerable part of the sanitary work of the Third Army was concerned with increasing the capacity of these rural and municipal systems. In this work, water supplies were increased, barracks built to obviate overcrowding, and mess halls erected to provide shelter for men at meals.²

Infectious diseases, with conditions highly favorable to their transmission to troops, were found to be prevalent among the civilians, the most important widespread epidemic diseases being typhoid fever and diphtheria.² Arrangements for dealing with the civil phases of the situation were in the hands of the chief sanitary officer, civil affairs, advance general headquarters, at Treves. By a close coordination between the medical organization of the Third Army, the chief sanitary officer of the section of civil affairs, and local German health officials' reports, on infectious diseases among civilians and reports of typhoid fever carriers were obtained systematically.² Through this system the Army exercised control over disease among the civilians and enforced various measures for improvement of civil sanitation.

Provision of facilities for disinfection and bathing were urgent sanitary problems during January, 1919.² At that time approximately 90 per cent of the men were infested with lice, consequent upon the lack of bathing and delousing facilities in the zone of combat and on the march. Upon the stabilization of troops in this area energetic efforts were made to free the command of these vermin. Only one Foden-Thresh machine was available, and the facilities for bathing were inadequate. Much improvised apparatus was constructed by division medical establishments and by the engineers; Serbian barrels, Canadian hot-air disinfestors, cave disinfestors, and steam barrels, supplied with steam from tractor engines or factories, were set up throughout the area. By these means, augmented later by standard steam disinfestors and portable shower baths, louse infestation was rapidly reduced, until by May 31, 1919, the degree of infestation as determined by inspection, was not above 1 per cent.²

During the first three months of 1919 the general camp sanitation of organizations of the Army was greatly improved.² The problems depending for solution upon the supply of lumber and other materials were efficiently

handled by divisions and the Corps of Engineers.² Improved construction of kitchens, screening of food receptacles, fly-proofing of latrines, and removal of manure piles and other breeding places of flies had progressed well toward completion before the commencement of the season when flies might prove prevalent. Supplies of clothing were ample; food supplies were sufficient, of good quality, and generally handled with cleanliness during transportation. Efforts to provide men with amusements which give them facilities for sports and other recreation were extensive and very beneficial.

The water-supply service was found to be the only sanitary work requiring a definite Army organization as distinct from that of the divisions.² The organization of the water-supply service was begun in the surgeon's office in January, 1919, when it was found that purification of water supplies at their sources would be necessary. Many of the towns in the area of occupation were supplied by water systems carrying tap lines to the houses. A number of these supplies were found on examination to be polluted, particularly in the towns in valleys of the Rhine, Moselle, and Ahr Rivers.² Since chlorination of water in water sterilizing bags was an inadequate control of drinking water for men who had free access to water from taps in houses, a water-supply service was organized under officers of the Sanitary Corps, with one section in the surgeon's office and another section in the office of the army chief engineer.² The section in the surgeon's office was engaged chiefly in conducting surveys and examinations of water supplies and recommending the installation of apparatus for systematic chlorination of water at suitable points. In this work the division field laboratories were being utilized as extensively as possible and proved of great value. The section in the chief engineer's office was concerned primarily with the assembling, construction, and installation of apparatus and the training and provision of personnel to operate the plants.

The first evacuation hospitals which operated in Germany were Evacuation Hospital No. 3, which reached Treves on December 3, 1918, and Evacuation Hospital No. 12, which arrived at the same city on December 4.² The former relieved a Fourth Corps field hospital which had taken over a German hospital on December 1.

During the week ending December 15, when the divisions reached their final areas, additional evacuation hospitals arrived. It was planned to have these evacuation hospitals function as base hospitals in order that as many patients as possible might be retained in the Army and returned to duty. To this end these hospitals were staffed and equipped as completely as possible with well-trained personnel and with adequate supplies.² Without exception, they were unusually well housed in suitable buildings, a few of which had been constructed for hospital purposes; others were in large schools and military barracks previously used by the Germans to care for the sick.²

It was the policy, as far as possible, to group the hospitals in centers so that special services could be more highly developed.² The large area over which the Third Army spread made it necessary, however, to place a few isolated hospitals at outlying points. The largest center was situated in Coblenz.² Here Evacuation Hospital No. 6 was established in a splendidly

equipped German military hospital. This was used for surgical and orthopedic cases and for sick officers and nurses. Evacuation Hospital No. 2 had a urological and contagious service. Evacuation Hospital No. 4, located in a schoolhouse on Oberwerth Island, had the eye, ear, nose, and throat cases, as well as medical service. Evacuation Hospital No. 14 took over the Bruderhaus hospital and, later, a military hospital in Ehrenbreitstein. This included neuropsychiatric and medical services and in addition was used as the triage to which all patients received in Coblenz were sent and thence distributed to other hospitals.

The second center, at Treves, consisted of Evacuation Hospitals No. 3 and No. 12.² In the former, surgical, orthopedic, eye, ear, nose, and throat, and medical services were developed; in the latter, urological, neuropsychiatric, contagious, and medical services.

To serve the more remote areas, Evacuation Hospital No. 8 was located in Mayen and Evacuation Hospital No. 7 in Prum.² In order to care properly for the 42d Division, at the extreme left of the area, evacuation on Hospital No. 26 was established at Neuenahr in a large hotel providing 1,000 beds.²

The Sixth Corps was attached to the Third Army during the first two weeks in April, 1919, and with it Evacuation Hospital No. 13, at Wolferdange, near the city of Luxemburg.² This hospital remained attached to the Third Army after the disbanding of the Sixth Corps. It was established in a château affording 150 beds. Additional beds to the total of 500 were provided in tents. Because of its limited capacity the hospital continued to function more as an evacuation hospital, sending many of its cases to the center at Treves.²

Some of the divisional and corps field hospital were put in operation, but retained only those cases which could be returned to duty in a few days. An exception was made in the case of the 90th Division, which occupied a large area.² Here it was considered advisable, because of the long distance to Treves, to equip a field hospital at Cues with female nurses and a good medical staff in order that pneumonia cases might be hospitalized.

During March, 1919, certain of the evacuation hospitals which had been longest in the American Expeditionary Forces were relieved by others with a shorter term of service overseas, as follows: No. 2 by No. 49, No. 6 by No. 27, No. 4 by No. 22, No. 8 by No. 30, No. 7 by No. 29, and No. 3 by No. 19.² Evacuation Hospital No. 16 relieved Evacuation Hospital No. 14 on April 3.² The retention, with one exception, of the commanding officers and of some of the medical directors of the relieved hospitals resulted in a continuity of policy. The decrease in the size of the Third Army led to the closing of the following evacuation hospitals in May:² Evacuation Hospital No. 9, Coblenz; Evacuation Hospital No. 12, Treves; Evacuation Hospital No. 29, Prum. None of the special services in these hospitals was discontinued, however, each being carried on in one of the hospitals remaining. It was assured that with the contraction of the medical activities coincident with that in the size of the army, the character and adequacy of the service did not suffer.

The epidemic of respiratory infections during January and February necessitated frequent evacuations to the services of supplies.² Occasionally the congestion of the hospitals in the Coblenz center was lessened by sending con-

valescent patients to Treves. Following the stabilization of the army in the occupied area, however, patients to be evacuated to the services of supplies were collected at the hospital centers.

Subsequent to the early part of March, 1919, the steady decline in the hospital admission rate made it possible to retain a much larger number of patients in the army until they could be sent to duty or it could be demonstrated that they should be returned to the United States. This policy created the necessity for convalescent sections in the hospital centers.² One of these was organized at Evacuation Hospital No. 19, Treves; one at Evacuation Hospital No. 9, Coblenz; and one at Evacuation Hospital No. 26, Neuenahr.

The Third Army laboratory service consisted of 2 Army laboratories, 10 evacuation hospital laboratories, 7 divisional laboratories, and limited laboratory facilities in isolated field hospitals, with 47 commissioned officers.² The laboratories were so distributed and their work so divided and coordinated that the entire army had immediate access to excellent pathological, bacteriological, chemical, and serological facilities. In addition to the routine work of the service, extensive bacteriological surveys of the water supplies in the Third Army area and surveys for chronic carriers of typhoid, paratyphoid, and dysentery bacilli among the troops were made. Several research problems were taken up, one on the earliest evidence of tuberculosis infection; another on the pneumonias; and still others, prompted by the interest of interested officers.

The major part of the professional work in the hospitals and divisions of the army fell upon the internists, due to the fact that by far the greater number of cases admitted to hospital were for medical, rather than surgical, conditions.² Since the evacuation hospitals had been organized principally for surgical work, it was appreciated that their personnel and equipment would not be adequate for the type of cases now to be treated, consequently in January, 1919, the staffs were supplemented with a number of internists.² A medical service under a competent chief was maintained in each hospital, and much shifting of personnel was done to put each service on the most efficient footing possible.

As the Third Army was reduced in size, more particularly during the release of the final divisions, the various evacuation hospitals were closed and returned to the United States, until Evacuation Hospital No. 27 alone remained. This occupied the buildings of the former German military hospital at Coblenz, which, as will be referred to below, became the base hospital for the American forces in Germany.

When the office of the surgeon, Third Army, became that of the chief surgeon, American forces in Germany, this difference obtained:² Whereas, the Third Army was a part of the American Expeditionary Forces, the American forces in Germany were subordinate only to the War Department, consequently there was now no intermediate officer between the chief surgeon and the Surgeon General, in so far as matters purely medical were concerned.

Also, certain changes in the Medical Department units were effected. As finally organized the Medical Department of the American forces in Germany was as follows:²

Chief surgeon's office.

Attending surgeon's and dental surgeon's office.

Medical supply depot.

Base hospital, including—

Convalescent camp.

Field Hospital No. 13.

Evacuation Ambulance Company No. 26.

Hospital Train No. 70.

Field Hospital No. 6.

Field Hospital No. 8.

Ambulance Company No. 6.

Provisional Sanitary Train, 2d Brigade.

Port surgeon's office, Antwerp.

Port hospital, Antwerp.

Medical Department personnel on duty with the various organizations operating infirmaries and prophylactic stations.

Veterinary service (chief veterinary officer in office of chief surgeon and veterinary officers on duty with mounted organizations).

Polish typhus relief expedition (attached).

With the replacement of troops of the army of occupation by regular troops, the plan of hospitalization necessarily changed.² Instead of evacuating to the United States each patient not expected to return to duty within a short period, a practice hitherto obtaining, all except surgeon's certificate of disability cases were to be retained and treated in Germany. Accordingly, a base hospital was established, and the sick from the various organizations were collected daily and treated in this hospital.²

The base hospital, American forces in Germany, was located in the western section of the city of Coblenz.² It occupied a group of buildings which at one time comprised the Germany garrison hospital of Coblenz, and was used by the Germans in part as a hospital and in part as a medical supply depot. There were 13 two-story concrete buildings, with whitestone foundations, stone-lined entrances and windows; they all were of modern type and in good repair, and had a normal bed capacity of 460.

Collecting daily and treating sick in the base hospital not only assured the proper segregation of cases of contagious disease, but also gave the patients the benefit of the best modern diagnostic methods and treatment by specialists.² But as the base hospital soon became overcrowded, it had to be enlarged by building a number of temporary frame wards.²

At first, five temporary buildings were added. These, with 152 beds, were located across the street from the hospital. Subsequently nine additional wooden frame buildings, of the Adrian type, were constructed. These buildings were heated by stoves, illuminated by electricity, and had modern sewerage connections and flush latrines. A series of wooden buildings (Adrian hut type) which were a part of the hospital was used as quarters for the detachment, Medical Department, and for the supply depot of the base hospital.

The increase in the activities of the base hospital also necessitated the establishment of a convalescent camp in connection with it.² Such a camp, with a bed capacity of 500, was opened on September 24, 1919. It was established primarily for the treatment of convalescent venereal patients, and throughout the period under consideration was utilized to its full capacity.²

Antwerp being a supply base for the American forces in Germany, it was necessary to provide for the local hospitalization of our troops there.² Early

arrangements were effected with the Belgian military authorities by which any members of the United States Army in Antwerp, when in need of medical or surgical attention, might be taken care of at the Hôpital Militaire d'Anvers. This arrangement worked very well, but had several drawbacks, among which may be mentioned the fact that any soldiers so treated were not under the control of the United States Army from the time that they were admitted to the Belgian hospital until they were discharged. There was also always more or less difficulty about getting men discharged on time and in some cases fraudulent release occurred through the Belgians not being familiar with the United States Army procedure. Ultimately a small port hospital of 75 beds was opened.²

Hospital Train No. 70 was turned over to the American forces in Germany and placed in use, evacuating disability cases to Antwerp, Belgium, for return to the United States.²

The amount of sickness among the American troops in Germany was never excessive.² Taking into consideration that these forces were made up mostly of recruits, the sick rate for communicable diseases was very low, although some of the contagious diseases, such as diphtheria, measles, and scarlet fever, were at times above the normal pre-war rate. No serious epidemics occurred. The good health of the command was attributed to the mild, equable climate of the Rhine Valley; to the good health and sanitation of the civil population; to the excellent housing conditions of the troops, most of them being in comfortable barracks; and to the careful supervision of sanitation by medical and line officers. With the exception of the control of venereal diseases, no difficult health problems presented themselves.

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CHAPTER XXIX

DEPARTMENT OF SANITATION AND PUBLIC HEALTH, GERMAN OCCUPIED TERRITORY ^a

The office of the department of sanitation and public health for civil affairs in German occupied territory was established pursuant to the provisions of General Orders, No. 1, advance general headquarters, A. E. F., Treves, Germany, December 13, 1918; however, the organization of the office had been begun by verbal orders issued by the commander in chief, A. E. F., about one week previously. It was the duty of this department to supervise and control the civil sanitary service in the occupied area with a view of protecting the health of the troops of the American Army of occupation and of guaranteeing to the civil population adequate medical service. The personnel of the department consisted of 12 officers, 4 nurses, and 9 enlisted men.

DISTRIBUTION OF TROOPS

The army of occupation, i. e., the third Army of the American Expeditionary Forces, consisted of eight divisions organized into three corps, with headquarters at Coblenz. These troops occupied an area west of the Rhine along the Moselle River, roughly 80 miles from southwest to northeast, from Treves to Coblenz, and about 50 miles in width, together with the northern half of the Coblenz bridgehead east of the Rhine. This territory included the kreise (circles) of Prum, Bitburg, Treves, Saarburg, Daun, Wittlich, and Berncastel, in the Government district of Trier, and Adenau, Ahrweiler, Cochem, Mayen, Coblenz, and Neuweid, in the Government district of Coblenz, with most of the Government administrative area of Montabaur, in Hesse Nassau. The estimated civil population of the territory occupied, and with whose sanitary control this division was charged, totaled 835,000.

GERMAN PUBLIC HEALTH SERVICE

Information was obtained concerning the personnel and organization of the German public health service by personal interviews with the civil officials in Treves and Coblenz and by a study of published regulations and reports of the service. It was found that it was administered by civil officials appointed by the Minister of the Interior. In each of the Government administrative areas, a civil medical officer was charged directly with the supervision of sanitary matters within his area; he was responsible to the administrative head of the district. As health officer of the community, he was the technical adviser of the administration with reference to all sanitary and public health matters. In general he supervised water supply and sewage disposal; received reports of communicable diseases and saw that lawful measures against their spread were

^a Based on: Report on the Department of Sanitation and Public Health, Civil Affairs, Treves, Germany. Period Dec. 7, 1918, to May 28, 1919, dated Nov. 1, 1919, by Col. Henry A. Shaw, M. C. On file, Historical Division, S. G. O.

enforced; made sanitary inspections of food supplies, including milk, meat, etc.; supervised the sanitation of schools and the medical examination of public prostitutes. He could not initiate sanitary regulations, but he kept in touch with all matters affecting the health of the community, and was held responsible for making proper and timely recommendations for the prevention of disease and the general improvement of sanitary conditions. He made weekly reports of communicable diseases and yearly reports of general health conditions to the administrative head of the district.

COORDINATION OF THE CIVIL AND MILITARY SANITARY SERVICE

As the German public health service appeared to be adequate and sufficient for the needs of the civil population, the manifest policy was to continue the organization in force, with such supervisory control and assistance by the American Military Establishment as might be found necessary. This was satisfactorily effected by directing division commanders to supervise the administration of the civil sanitary service within their divisional limits. As these areas corresponded fairly closely with administrative areas, division surgeons were enabled to cooperate effectively with the local health officer, obtaining from him information concerning the health of the civil population and the sanitary conditions of the country and at the same time giving him information concerning the health conditions of the military units. In this the work of the civil and military organizations was coordinated, each reporting to the other essential data affecting public health.

Reports from division surgeons of cases of communicable disease in both civil and military populations reached the office of the chief sanitary officer through the chief surgeon, Third Army. Weekly reports of communicable diseases in the civil community were also received from the chief German sanitary official of the district of Treves and of Coblenz. Cases of typhoid fever were in addition reported from the director of the German laboratory at Treves. Division surgeons made a special monthly report to the chief sanitary officer through channels regarding important matters pertaining to public health and sanitation in the civil population, a separate report being rendered for each administrative area. Thus, reports were received and tabulated from both civil and military sources enabling the chief sanitary officer to keep in touch with health conditions in both communities.

MEDICAL SERVICE FOR THE CIVIL POPULATION

One of the first endeavors of the office was to get in touch with the German civil sanitary officials both in Trier and in Coblenz for the purpose of obtaining information concerning the adequacy of the established public health service with respect to personnel and material, and also to learn whether the needs of the civil population were satisfied as to medical attendance, hospital and laboratory facilities, and medical supplies and drugs. Though the public health service, as noted above, was found to be generally adequate and competent, it was reported that there were insufficient German physicians to care for the civil population in the occupied territory.

HOSPITALS

All hospitals were under the administration of the Minister of the Interior of Prussia and made regular reports concerning the number of beds, the character of patients, the number of admissions and discharges, and the causes of death. In the entire district of Coblenz there were reported to be 39 institutions for the care of the sick, with a total of 3,825 beds, and of these only 2,282 were occupied. In the Treves district there were 2,214 beds available, this number being sufficient to care for the needs of the civil population. The total number of beds in Coblenz was approximately 5 per cent of the population and in Treves 2.2 per cent. In both districts the number of hospital beds had been increased during the war to care for soldiers and was larger than the number that sufficed in time of peace.

The civilian authorities were informed that in emergency, and also in case of communicable disease, where isolation could not be promptly obtained by German civilians, such patients would be admitted to American military hospitals.

LABORATORIES

A well-equipped laboratory under the control of the public health service had been established in Treves and was found to be very efficiently administered.

MEDICAL SUPPLIES AND DRUGS

Reports from hospitals, laboratories, public health officials, physicians, and druggists showed that many of the essential medical supplies and drugs were either exhausted or to be found in extremely limited quantities. Such were gauze, cotton, and soap for surgical work; rubber articles; certain drugs, as iodine and the iodides, sulphur, boric acid, camphor, and the vegetable cathartics. Estimates were made of the needs of the population based on the number of hospital beds, and recommendation made that certain enumerated supplies and drugs be furnished by the Medical Department, United States Army, to German hospitals and laboratories in the occupied area. These recommendations were approved in substance, and the necessary measures taken to carry them into effect. The cost of the supplies was charged to the German Government.

HEALTH CONDITIONS

A comprehensive study was made of the health of the civil community in Germany during the war and particularly in the occupied area, the material for which was drawn from official reports from civil and military sources, from interviews with German physicians and civil officials, from vital statistics published by the German Government, and from personal examination of various groups of the German population.

VITAL STATISTICS

Births.—The average birth rate for this region during several years previous to the war had been about 30 per thousand; in 1914 it was 23.8; in 1917, 15.6, and in 1918, 16.1. Illegitimate births in the occupied area in Germany showed little variation in the rural districts before and during the war, but in the cities the rate was about doubled in 1917 and 1918 as compared with 1915.

Deaths.—In the occupied area the death rate for several years previous to the war averaged 15 per thousand inhabitants; in 1915 it was 20.5 and in 1918, 27.2.

Communicable diseases.—There had been a marked increase in the number of communicable diseases in Prussia in 1914 and 1915. This was to be expected on account of war conditions involving rapid mobilization of troops and billeting with civilians; many localities were left with insufficient medical personnel. In the American area the most notable increase in these diseases had been in typhoid fever, tuberculosis, diphtheria, and especially dysentery; previous to the war this disease had been almost negligible in this region, but it appeared in Trier in 1914 and in Coblenz in 1915, increasing during the following years; in Coblenz there were over 700 cases in 1917, and in Treves more than 1,000 in 1917, and nearly 1,900 in 1918.

Among the civil population of Germany, tuberculosis in all its forms had more than doubled during the war, a fact shown chiefly in death statistics, as living cases were not reported. A corresponding increase of tuberculosis among the living was indicated by the fact that the Government insurance offices in the cities of Trier and Saarbrücken paid benefits to 48 cases of pulmonary tuberculosis in 1914; the number rapidly increased during the war and in 1918, 208 persons received insurance for this disease. Of all the etiological factors entering into this increase the shortage of food was most important. This increase had been much less marked among the comparatively well-fed rural population than among the city dwellers who were more strictly rationed.

FOOD PROBLEM

One of the most interesting matters for investigation was the food problem in Germany, since this question in one form or another was met with at every turn.

To solve the problem of a diminished food supply, Germany proposed national rationing. This was begun early in 1915, first in regard to bread and then extended in the same year to potatoes and meat and finally to nearly every essential food product. The rationed articles could be obtained only on tickets, in specified amounts and at prices fixed by the Government. After the failure of the potato crop in the fall of 1916, food conditions went from bad to worse, so that before the end of the war the ration allowances in most parts of Germany were less than half the usually accepted estimates for physiological requirements for health. In general, it may be stated that the allowances in 1914 averaged about 3,000 calories for various localities; in 1915, about 2,000 calories; in 1916 and 1917 about 1,500 calories, and in 1918 between 1,200 and 1,500 calories. In December, 1918, the allowances for Cologne were 1,480 for Coblenz 1,490, and for Treves 1,408 calories. The rationed articles for this period in Treves were as follows for one week:

	Grams	Calories	Cost in marks
Bread, whole rye, 4-pound loaf.....	2,000	4,800	0.96
Potatoes, 1 pound per day.....	3,500	3,073	.63
Sugar.....	156	620	.18
Meat, including 25 grams sausage.....	150	260	.62
Fat (margarine).....	50	450	.43
Marmalade, cereals, dried soup, etc.....	594	650	.81
Total.....	6,450	9,853	3.63
Per day.....	11,8	1,408	.52

¹ Pounds.

Because of illicit traffic in food supplies, hoarding was practiced by farmers and by the wealthy, and among these there was not so great inconvenience and distress as among the poor in the large cities.

FOOD VALUE OF THE RATION

That the ration allowance during the latter months of the war was pitifully inadequate is shown by a glance at the following figures:

	Average diet	Treves ration
Protein	12-15	8.3
Fat	18-20	10
Carbohydrates	60-65	81.7
Total calories	3,000	1,408

The ration was diminished both relatively and absolutely in protein and fat, and in caloric value reduced almost one-half in carbohydrates, and more than half in total amount. The dietary of the poor people was somewhat augmented by the addition of such vegetables as cabbage, carrots, beets, and greens, which could be purchased during the winter in open market at very reasonable prices. While these vegetables added to the bulk of food, its caloric value was probably not increased much more than 175 or 200 units.

EFFECTS OF FOOD SHORTAGE

It was difficult to estimate the effect on the civil population of this enforced reduction in diet; in any event, the results related only to a limited portion of the inhabitants. In general, farmers and country people had enough for their own needs and more; the well-to-do always found ways to procure an abundance of food. Those who suffered real physical privation were the poor in the cities; this class has been estimated from 10 to as high as 25 per cent of the total population; the lower figure was probably nearer the truth.

This loss of weight was not an unmixed evil, as there was evidence, at the time of our occupation, of improved physical condition of the obese and overfed, the gouty and the diabetic.

Children of school age, 6 to 13 years, were found to have suffered directly as the result of improper and insufficient nourishment. Two thousand five hundred children in Treves and vicinity were found in general to be under the average normal height and weight of German children during peace times. A large number were found to be small in stature and thin in build, pale and anemic and with poor nutrition; these conditions were found most frequent and most marked among the poor. Reports to the same effect were received from numerous sources in Germany.

In a comprehensive psychiatric survey of the school children of Treves, it was found that, chiefly as the result of malnutrition, there was a lowering of the whole standard of school work; loss of nervous energy exhibited by 40 per cent of the children; an increase in the number of border-line defectives of not more than 1 per cent of the total school population; and an increase in the number of children failing to pass their grades from 8 per cent in pre-war

years to 15 per cent in 1917 and 1918. These conditions were, however, not found in nearly so marked a degree in the cities of Cologne, Bonn, and Coblenz.

War edema so commonly seen throughout Germany was very generally attributed to insufficient nourishment. The British, it was learned, noted that it appeared when fat was markedly reduced in the dietary, and that the symptoms cleared up when fat was added.

As a result of the food survey which this office began early in January, the following report (in part) was made January 31 to the officer in charge, civil affairs:

The evidence at hand indicates undernourishment of babies and young children. Nursing mothers are not properly nourished, and their babies do not gain in weight as they should. Bottle-fed babies can not be properly fed on account of the lack of milk. Children are undernourished mainly by reason of the lack of fats and milk. In regard to the sick, one of the most important considerations is a proper diet. There is ample evidence that sick are dying or that convalescence is greatly lengthened on account of lack of a nourishing and easily digestible diet. White bread, rice, milk, and some easily digested fats are essential.

With regard to the general population, there is no doubt that the middle class and poorer people who can not afford to pay exorbitant prices for food are undernourished, and in many cases resistance is thereby lowered so that they become more susceptible to disease. As it is manifestly impossible to secure a perfectly even distribution of all the food available in the American area, it is almost certain that some of the essential articles of diet in the ration allowance will before the next harvest become exhausted in certain localities, such as the industrial centers, and that it will be impracticable, perhaps impossible, to supply such districts from German food stocks. It is therefore believed that our Government should have on hand the necessary supplies to make good these deficiencies and should be able to control the distribution. It is probable the first serious cry for food will be for bread. The present dietary is deficient in protein and fat. The deficiencies would be made up by wheat, which is rich in protein, and by pork, which in addition to protein is rich in fat. Potatoes will probably be demanded in certain localities, as this vegetable is even more of a staple than bread. Rice is an excellent substitute for potatoes. In addition, bacon or margarine might be economically issued to replace the deficient fat. Canned beef or canned salmon would form valuable additions to the present dietary and if on hand in excess might be used to advantage.

The following recommendations were made at the same time:

That steps be taken to increase the dietary of nursing women, children, and the sick by the addition of wheat flour, rice, condensed milk, and butter or margarine.

That the United States Government be prepared to issue to the general population wheat flour (preferably whole wheat), meat (preferably pork), bacon or margarine, and rice.

The food situation in the American area remained practically unchanged during the winter of 1918-19 and early spring of 1919. The component parts of the ration varied somewhat from time to time, the general situation getting rather worse than better, until with the opening of spring and the advent of a wealth of green vegetables conditions began to improve. On April 20, 1919, the first American food was brought in and sold to German civilians, increasing the ration to about 2,100 calories. Articles on sale consisted of flour, rice, canned milk, bacon, canned beef, and canned salmon, but unfortunately the prices were so high that very little of the food reached those who were most in need of it.

An investigation of the physique of school children in Treves indicated that many of the physical defects noted and much of the suffering and hardship

endured by them were due to the unhygienic surroundings in which they lived. With a view of obtaining definite information as to the living conditions of the poorer portion of the population, a house-to-house survey, including over 1,000 families, was made by American Army nurses accompanied by German social welfare nurses. This survey showed that because of overwork, neglect of homes and children, and especially because of the war ration, disease, especially tuberculosis, had increased among the poor people in the city of Treves. The following facts in their report are quoted:

Average number of persons per family-----	7. 1
Average number of rooms occupied per family-----	3. 52
Average number living children per family-----	4. 08
Average number dead children per family-----	2. 07
Number of families with sickness at time of visit-----	757
Number of families with history of tuberculosis-----	282
Number of families with some member tuberculqus-----	379
Average earnings per family per week, marks-----	61. 02
Average cost of living per family per week, marks-----	51. 89

(At the time of this survey, the value of the mark was about 8 cents.)

SECTION VI

MEDICAL DEPARTMENT ACTIVITIES, AMERICAN FORCES IN FRANCE

The American forces in France was created under General Orders, No. 88, G. H. Q., A. E. F., August 22, 1919, as the organization to take over from the American Expeditionary Forces the command and control formerly exercised by the American Expeditionary Forces, except that part which was in occupied Germany, in the Grand Duchy of Luxemburg, and in Belgium. The American forces in France was in reality a continuation of the former services of supply, A. E. F.¹

The activities of the chief surgeon's office, A. E. F., became continuous with those of the office of the chief surgeon, American forces in France,² and were of the same character but on a much reduced scale, as indicated in the preceding paragraph. The summarized report of the chief surgeon, American forces in France, covers the final steps in the discontinuance of the affairs of our forces in France.

PERSONNEL

Activities connected with the personnel of the Medical Department involved the orderly return to the United States for demobilization of the large sanitary personnel remaining in France on July 1, 1919. Release of temporary officers and men was facilitated, and they were replaced by regular officers and men where necessary. Various regular officers were selected and detailed to the Polish typhus relief expedition. Close liaison was maintained with the American forces in Germany, and many specially qualified officers and men were supplied them as needed and as they could be spared from France. Owing to defective reports, several thousand individuals were unaccounted for on the personnel records. To overcome this error, special details were put in the central records office and the adjutant general's office; all sailing lists were secured and checked, the central post-office records were consulted. By these means the personnel records were made very nearly complete before being finally forwarded to War Department.²

FINANCE

Claims for services rendered or supplies delivered to various hospitals and units throughout France were investigated, and vouchers prepared and paid during the above period as follows:

Month (1919)	Number of vouchers paid	Total amount
August.....	109	\$18,682.55
Sept. 1-11.....	11	
Sept. 11-30.....	52	
October.....	63	5,001.92
November.....	28	1,692.23
	52	6,997.64

Many of the accounts paid during this period were of long standing, the original bills having apparently been lost. Investigations of these charges were difficult on account of insufficient receipts or orders having been given by American officers who received the supplies or engaged the services, and on account of the impossibility of getting in touch with the officers or units they having returned to the United States.²

After November 15 no further payments were made by the Medical Department, but all vouchers were prepared and submitted to the quartermaster disbursing officer for payment. After the medical disbursing officer ceased to function a total number of 70 claims for services rendered or supplies delivered (many of these being final settlements covering a series of transactions with the various persons or companies and requiring a complete check of all bills rendered and paid in order to avoid duplication) were investigated and vouchers prepared for submission to the quartermaster for payment.²

Bills for hospital treatment of allied soldiers in American hospitals were prepared from the reports of the hospitals and submitted to the various governments in accordance with prevailing orders.²

Government	Number of bills	Amount	Government	Number of bills	Amount
French.....	46	355,490.75 francs	Rumanian.....	3	315.50 francs.
English.....	2	£5 2s.	Russian.....	75	44,171 francs.
English Y. M. C. A.....	2	£1 10s.	Italian.....	10	7,372 francs
Belgian.....	4	393 francs.	Serbian.....	1	169 francs.
Polish.....	2	60.50 francs.			

Bills from the French Government for delivery of supplies and for treatment of American soldiers in French hospitals were checked (115 bills received during this period). These bills, as well as the bills submitted to the French Government, were included in the general settlement between the French Government and the liquidation commission of November 29, 1919.²

Invoices covering supplies sold by the Medical Department to private individuals, firms, and allied governments, or liberated countries were checked, and bills prepared and submitted covering same. The volume of this work is indicated by the following tabulation:²

Supplies sold to—	Number of bills	Total amount of sales	Supplies sold to—	Number of bills	Total amount of sales
French.....	3	\$20, 613. 60	Ukrainian.....	10	\$1, 132, 161. 33
Serbian.....	1	9, 620. 00	Latvia.....	1	160, 099. 07
Polish.....	9	1, 718, 544. 25	Lithuanian.....	5	669, 838. 58
Estonian.....	2	358, 331. 22	Sales to private concerns.....		65, 569. 21

Vouchers prepared, covering supplies delivered to the American Expeditionary Forces in France, by the British Government for submission to London for payment.

SUPPLIES

Besides the issue of supplies for current use, the supply division handled the shipment to the United States of a considerable amount of property ordered returned; transferred to the Red Cross \$10,000,000 worth of supplies as provided

by act of Congress; made deliveries to various purchasers as indicated under the finance heading, and finally delivered the balance to the French Government under the purchase agreement. A preliminary settlement of the accountability of many organization medical supply officers was made.

HOSPITALIZATION

Sufficient hospitalization constantly was maintained, but base and camp hospitals were released as rapidly as they could be spared, so that by the end of 1919 all had been disposed of. Arrangements were made for civil hospitalization in Paris during December. The liability of the Government for the medical care of civilian employees has been eliminated by the adoption of a new form of contract. Full information as to securing civilian attendance for officers and men to whom Army medical attendance might not be available was published for use of personnel on detached service.

SANITATION

The chief activity under this heading was the continuance of the most vigorous antivenereal campaign, and the establishment and maintenance of four large segregation camps, at Gievres, Bordeaux, St. Nazaire, and Brest, for the treatment of venereal diseases. At the end of the period the few remaining venereal cases were returned as patients for the completion of their treatment in the United States. These activities were successful in carrying out the purpose that only venereally clean personnel should be demobilized. The inspections and detention also eliminated lousiness and skin infections among returning troops. Fortunately, there were no epidemic outbreaks of disease to handle during the period.

TRANSPORTATION

One hospital train was transferred to the American Forces in Germany. The others were released as they could be spared, the last one early in October, shortly after the repatriation of the last sick prisoners of war. Since that time necessary railway transportation has been successfully carried out by ordinary train, necessary attendants being assigned. Motor transportation has been similarly disposed of by turning it in as rapidly as it could be dispensed with.

SICK AND WOUNDED RECORDS

The main sick and wounded records were shipped to the United States in the summer of 1919. A branch of this office continued to collect and tabulate records of American patients in French hospitals until November 30, when the work was completed. Current records were checked for correctness and transmitted to the Surgeon General as received.

REFERENCES

- (1) Letter from the commanding general, American forces in France, to The Adjutant General of the Army, January 7, 1920. Subject: Report on operations of the American forces in France. On file, A. G. O., World War Division, 370.2.EE.
- (2) Letter from the chief surgeon, American forces in France, to the commanding general, American forces in France, December 30, 1919. Subject: Report from July 1 to December 30, 1919. On file, A. G. O., World War Division, 319.1.

APPENDIX

REPORT ON ORGANIZATION, EQUIPMENT, AND FUNCTIONS OF THE MEDICAL DEPARTMENT ^a

INTRODUCTION

To meet the manifold requirements of both trench and mobile warfare the Medical Department of the American Expeditionary Forces was modified in both personnel and equipment to such an extent that the resultant changes bore but small relation to existent tables of organization and equipment manuals. Adoption of the modified general staff system necessitated expansion of the office of the chief surgeon, A. E. F., and its division into bureaus, the work of all under the chief surgeon being coordinated through the assistant chief of staff, G-4 (coordination), of the American Expeditionary Forces, under whose jurisdiction fell all the services which under the former staff organization enjoyed autonomy, the chiefs of services being members of the administrative staff of the commander in chief.

This control of the services by the A. C. of S., G-4, was applied to the armies, and there being no A. C. of S., G-4, in corps and divisions, the A. C. of S., G-1 (administrative), assumed the coordinating function. Formal inspection of troops made by the surgeons of armies, corps, and divisions, or by the sanitary inspectors, were under the A. C. of S., G-5 (training), for efficiency, and under the A. C. of S., G-4, for supply, the last two duties being under G-1 for corps and divisions.

The office of the chief surgeon, A. E. F., being moved from general headquarters to the headquarters, S. of S., it was necessary to detail an officer of the Medical Corps for duty at general headquarters as deputy of the chief surgeon, A. E. F., who would advise him upon all questions arising with reference to the Medical Department for adjustment, and who was empowered to act for the chief surgeon in emergency. This detail was authorized by G. O. 31, A. E. F., 1918, which order announced the policy of the division of staff control, and established the five general staff sections at general headquarters.

Expediency demanded that mobile operating units, composed of surgical and X-ray equipment for two operating teams, packed in heavy chests, be supplied in the proportion of one to each division for use in the nontransportable hospital. So-called mobile hospitals with a capacity of 150 beds and 2 special camions, self-propelled, for the necessary surgical and X-ray equipment, each camion with a trailer containing a small frame-and-canvas hut, in the proportion of one to each division in line, were found necessary by reason of the lack of adequate evacuation hospitals during the first engagements of American forces. Experience and lack of transportation both counseled the abandonment of these two units.^b Neither was mobile in any sense of the word and they were of little use, especially the mobile hospital, which possessed but little bed space in proportion to its operating capacity. The latter suffered also from the disadvantage of special camions, which should never be

^a Pursuant to directions of Brig. Gen. Walter D. McCaw, M. C., chief surgeon, A. E. F., a board of officers was convened, subsequent to the signing of the armistice, at general headquarters, A. E. F., to investigate and report upon the conduct of the Medical Department, A. E. F., and to make recommendations, with a view to the improvement of that department. This board, consisting of Col. A. N. Stark, M. C.; Col. Leon C. Garcia, M. C.; and Col. Albert P. Clark, M. C., made an exhaustive study of the organization, personnel, equipment, service, and transportation of the Medical Department, A. E. F., and submitted the findings given herein, in April, 1919. Pertinent editorial comment in the form of appropriate footnotes has been made in order that the most salient features of the board's report may be compared by the reader with the present organization of the Medical Department of the Army of the United States as perfected up to this date (July, 1926).—*Ed.*

^b The relative lack of mobility of the so-called mobile hospitals employed by the American Expeditionary Forces in France was largely due to the utilization of the only type of tentage and equipment available. These hospitals were devised by the French during the period of trench warfare. In the absence of adequate hospitalization, especially as regards evacuation hospitals, the mobile hospitals of the American Expeditionary Forces played a very important rôle in bridging over our difficulties. The field hospital for nontransportable wounded, recommended by the board, has been provided for. It is known as a "surgical hospital" and has a normal capacity for 250 patients. See Tables of Organization, 284-W.—*Ed.*

employed, and they required half the number of trucks needed to move an evacuation hospital. A properly equipped field hospital for nontransportable wounded has been developed. These must be designated corps units and will become a part of the tactical reserves at the disposition of the corps surgeon. They will be organized upon a basis of one for each division of the forces. The functions and organization of these units will be fully discussed under the part devoted to the corps surgeon.

Tables of organization in force at the time of the enemy offensive of 1918 did not afford sufficient enlisted personnel and nursing staff for the proper conduct of evacuation hospitals, necessitating the stripping of base hospitals for nurses and other medical organizations for enlisted personnel, even labor troops being employed to obtain the requisite number, this number, found by experience to be proper, being given, in the chapter devoted to evacuation hospitals.

Standardization of equipment is as necessary to efficiency in the medical service of an army as it is in any industry, and to that end the ward tent has been modified to be used for all purposes by the Medical Department in the field, all other makes being discarded for various reasons, such as weight, complicated system of erection, small interior space to spread of canvas, inflammability, and difficulty in transportation. The surgical, X-ray, and lighting equipment, together with the medical and other equipment, has been simplified and so arranged that the evacuation hospital is, as nearly as possible, a multiple of the field hospital in all essential particulars.

Prompt and correct disposition of the slightly wounded and sick of an army taxed the resources of the Medical Department because of lack of an institution similar to the French depot d'eclopés, it being recognized that these cases should not be evacuated from the army zone with great resultant depletion of combat troops, and the solution of this vexing problem has been met by the establishment of the army convalescent camp, which is explained in detail in the chapter devoted to that subject.^c

Due to the absence of civil population in the combat zone, the difficulties of having laundry work done for hospitals was enormous, the small so-called mobile laundries purchased in France being too fragile to permit traction over the rough roads, and as experience has proven the absurdity of collecting within the combat zone more mechanical appliances than necessity demanded, it has been decided to have one large demimobile laundry, on flat cars if possible, in the vicinity of the main army medical supply depot to which hospitals could send the bulk of soiled linen to be exchanged for fresh. Divisional field hospitals, corps, nontransportable hospitals, and evacuation hospitals have, in addition, a small gasoline motor-driven laundry for operating-room and ward linen.

Much has been said for and against the horse-drawn ambulance, but the fact remains that this form of transportation for sick and wounded was seldom used and at these times only in the dense Argonne Forest, where motor vehicles could not progress but where the wheeled litter would have proven more valuable than the horse-drawn vehicle.

A motor-propelled vehicle may not keep pace with an infantry column without destruction of the gears, and utility being *pari passu* with standardization, it has been decided to employ a four-wheeled medical wagon with cut-under front wheels, springs, and roller bearings to permit traction when the artillery has commandeered the animals or they have been killed, this wagon to carry the battalion combat equipment and also to be provided with litters that it may be employed for ambulance purposes, all these wagons being stationed at the camp of the supply company.^d The heavy pack saddle to bear combat equipment was never used, and as it was authorized under an entire misapprehension of modern warfare it has been decided to abandon it and substitute for it a harness for the draft animals of the medical wagons which, by releasing the tugs and slipping a numnah beneath the small saddle and applying a light metal pack frame with hooks to receive the loops of the

^c These units have been provided for at the rate of one per field army. Each will have a capacity for at least 5,000 ambulatory patients. They will be known as convalescent hospitals. See Tables of Organization, 285-W.—*Ed.*

^d A medical wagon of this type has been adopted. It is designated as the animal-drawn ambulance, new pattern. It is capable of carrying the field medical set of the battalion and at the same time, if necessary, of transporting patients, thus serving in the dual capacity of a cargo and passenger vehicle.—*Ed.*

medical panniers which are secured by a surcingle, leaves the animal standing in a simple modified pack harness. The medical wagons will also carry wheel litters which will not only be available for transport of combat equipment forward when animals can not be used, but also will be of great service at battalion aid stations. One of these wagons added to the regimental transportation will serve as solution of the vexing question of transporting the regimental dental equipment and will insure its being at the desired point.

The camp infirmary, and reserve, have been abandoned as useless adjuncts to medical equipment, for the reason of their adoption—the preservation of combat equipment intact—no longer obtains with the changed system of medical supply in the field, and these units make needless draft upon transportation not compensated for by their small use.

Experience soon demonstrated the imperfections of the intradivisional evacuation system as given in manuals and tables of organization. Permanent cadre of the sanitary train of the division must be organized basically upon needs of troops upon the march, with a flexible auxiliary organization of reserve transport units with the corps or army to care for combat problems. This will permit the corps surgeon to supply these transport sections to such divisions of the corps as are most in need. It may later be advisable to extend this system to the hospital section of the train as well.

Separation of our division ambulance companies into a transport and a bearer section also has not proven satisfactory, for the bearer section has seldom been used in its normal function of littering wounded from the battalion and regimental aid station to the dressing station, and never from the front line to the aid station, which would have been the point of greatest usefulness. In addition, dressing stations were seldom established, as they soon were found to be of little use.

While we were not wedded to any particular system, we have found by much experience that the French system of an ambulance service for transport only, and a litter bearer battalion (*brancardiers*) which could be applied anywhere as needed, gives the most effective service, and to that end we have abandoned the present ambulance company and have formulated the ambulance service (just described) whose elasticity is enormous, and have formed bearer sections into a battalion of litter bearers under control of the division surgeon who may apply them, as a whole or as a part, to the line when needed, thereby not only overcoming the difficulties which formerly obtained under the old system, but minimizing the demand upon combatant troops for this necessary service. There have, however, been retained two dressing station equipments for each division, which will be of service, in a flat terrain, this equipment being carried in two 3 to 4 ton trucks attached to the litter bearer battalion.*

The medical chests as now authorized contain many medicines and appliances that may be eliminated under modern conditions of supply, and the chests being unnecessarily heavy and of small capacity for dressings known to be useful, the development of a light, canvas-covered wicker pannier for all units must be considered.

The medical belt and Medical Department pack for enlisted men have proven a source of much dissatisfaction both as to contents and methods of packing, etc. The contents of the pockets of the belt have been found more or less useless in modern warfare and we have agreed upon the Infantry pack with a belt to maintain it in place. The hatchet has been found of less use than might have been expected and if retained must be modified and strengthened. An infantryman's shovel is considered a far more useful article to the sanitary soldier on the front. Front dressings, a rubber tourniquet, shears, adhesive plaster, iodine swabs, etc., must be carried in a bag similar to the haversack or musette bag, slung

* The sanitary train has been supplanted by the medical regiment, of which 1 is authorized for each Infantry division, 1 for each army corps, and 4 for each field army. In general the recommendations of the board have been embodied in the new organization. The medical regiment, includes a collecting battalion, which provides a collection station (dressing station) and the litter bearers. The ambulance battalion has two motorized companies and one animal-drawn company and is exclusively a transport unit. The hospital battalion consists of three hospital companies (field hospitals), and in view of the adoption of the surgical hospital (an army unit) is now freed of the necessity of caring for nontransportable wounded. There is also included in the medical regiment a veterinary company, and a service company, containing a laboratory section and a supply section. In the Cavalry division a corresponding type of organization has been provided, which is known as the medical squadron. See Tables of Organization 81-W and 489-W.—*Ed.*

from the shoulder.⁶ The medical officer's belt is useful with combat troops, but its equipment must be modified to include, among other things, the assorted Greely units.

The use of mounts for medical and dental officers must be minimized, since motor transportation has so largely superseded other forms when a column is en route. Motor-cycle side cars must be assigned in numbers sufficient to cover this need.

The laundry question for front-line troops has proven a stumbling block in all armies, and, as a division in line may not be accompanied by such impedimenta, it is recommended that large laundries, to be conducted by the Quartermaster Corps, be established in rest areas for the benefit of divisions relieved from the line, and that delousing and bathing plants with a supply of clothing be established at the same location, all these plants to be under control of the Quartermaster Corps and provision made for their early functioning.

I

ORGANIZATION OF THE MEDICAL DEPARTMENT FOR FIELD SERVICE IN CAMPAIGN

The enormous and sudden expansion of the United States Army for service against the Central Powers demanded reorganization of all branches of the Military Establishment along new lines. The great changes in military tactics and the marvelous development of lethal weapons necessitated a complete change in preconceived plans for the medical service.

A study of the operation of the medical departments of the British and French Armies threw but little light upon the problem, inasmuch as the equipment of American units and the organization of the units themselves differed so materially from both in the services of the British and the French.

The first employment of American troops in corps formations during the Marne offensive in July, 1918, disposed of many preconceived ideas to which the Medical Department of the United States Army had long adhered and served to outline a medical organization which would be effective in either mobile or trench warfare.

It is feared that too much attention was given to the study of phases of trench warfare to the exclusion of the phases of mobile warfare, for the former is an undesirable and unfortunate condition forced upon a commander who has lost the power of offense, and which, if continued, soon develops special routine to the great detriment of the force should mobile warfare suddenly supervene.

In the long and indecisive period of trench warfare special hospitals for the care and treatment of head, chest, abdominal, fracture, and gas cases soon grew up behind the lines, and great importance was attached to these institutions by medical observers and writers who failed to note that immobility—the greatest error in sanitary or military tactics—had insidiously developed, and few foresaw what would occur should the enemy suddenly give over defensive tactics and assume the offensive.

Fortunately, the few who realized what did actually occur when the enemy advanced in March, 1918, when our allies lost their special immobile hospitals, took steps so to organize the field and evacuation hospitals of the American Army that they would function alike in either trench or mobile warfare and still retain that mobility which is the sine qua non of any field unit.

No time was wasted in instructing the personnel of these units in such subjects as visibility problems, for the advent of the aerial observer disposed for all time of the question of visibility for sanitary units and imbued sanitary commanders with an intense desire to obtain the most conspicuous Red Cross emblem available, as observations taken by the aerial observers made accurate indirect fire possible both day and night, and only common sense was necessary to avoid direct fire.

Function and speed in establishing, in demounting, and in moving were instilled thoroughly, and the results amply justified this radical departure from established custom. The increase in sanitary units to meet the requirements of such a large force as was finally nominated an army demanded the assignment of competent officers to duties never before contemplated, and while other assignments did not bear the approval of Tables of Organization, they did receive the approval of competent authority, and the results amply justified the assignments.

⁶ The individual professional kits of all officers and enlisted men of the Medical Department now embody the bag principle recommended by the board. For example, a medical officer carries on his person, slung from the shoulder, an officer's medical kit. A medical private carries a private's medical kit, etc.—*Ed.*

MEDICAL DEPARTMENT SANITARY SERVICE

THEATER OF OPERATIONS, EXPEDITIONARY FORCES

The office organization and duties of the chief surgeon of an expeditionary force have been touched upon under another heading (q. v.), but the relations of his office to general headquarters, to his deputies, and to his representatives and subordinates in the zone of the armies must be amplified to gain a comprehensive understanding of the otherwise intricate chain of liaison and delegation of duties given in the accompanying chart.

In the accepted scheme of organization the chief surgeon is a member of the administrative staff of the commander in chief, but the complex duties required of him in modern warfare demand that the burden of detail be removed from his shoulders and placed upon those of his assistants to afford him time and opportunity to deal with larger questions of policy and to become familiar through personal observation with all the activities of his department.

The chief surgeon, though not his office force, will be located at general headquarters, which places him in close touch with the chief of staff of the forces and with the chief surgeon of the group of armies. In this position he still maintains his liaison with his deputy upon the staff of the commanding general, the services of supply, from whose office medical activities in the territory of the services of supply are controlled.

While frequent visits to, and even temporary location at the headquarters services of supply, will be necessary, there must be a deputy chief surgeon at those headquarters to assume responsibility required in this situation. So also must there be a deputy chief surgeon within the general headquarters group. This officer, however, will deal only with the larger questions of policy and coordination, but in the absence of his chief will act for him in all questions arising in connection with Medical Department activities within the zone of the armies or the general headquarters group. Furthermore, he must exert technical supervision and control over the medical officers detailed to represent the chief surgeon upon the various general staff sections, although these latter officers are assistants to the assistant chief of staff of the sections to which attached.

As a member of the administrative staff of the commander in chief, the chief surgeon must spend much of his time away from the two administrative headquarters, for only in this way can he keep himself well informed as to the status of the Medical Department with the armies and the activities of his department throughout the larger zone of the services of supply. It therefore becomes necessary for him to maintain a temporary office, so to speak, within the office of each of the two deputies.

The deputy at general headquarters will maintain an office and office force wherever such facilities are available. In practice, excellent results have been obtained by making this office a part of the coordination section of the general staff, with the deputy actually a member of that section and in charge of a subgroup of the section (the medical section, G-4-B). This has been true largely because this general staff section coordinates with the greater part of Medical Department activities. It is quite possible, however, that it was true somewhat because of the personalities of the individuals concerned. No machine, however perfectly organized, can be expected to function just as efficiently with the personal equation eliminated, but the organization adopted for the Medical Department must be so flexible as to permit the elimination or utilization of this equation when such elimination or utilization would obviously work to better ends. Arbitrarily to say, therefore, that the office of the deputy must be located with the medical officer representatives with the coordination section would be a mistake, since it might be found that better results might be obtained if the medical section "grew up" as a part of, we will say, the operations section. For this reason, also, although medical officers detailed to the sections should be detailed general staff officers, it would seem better that the deputy at general headquarters as well as the deputy as services of supply headquarters remain a member of the Medical Corps.

At general headquarters and the services of supply headquarters a medical officer must be detailed to each general staff section. These officers must truly represent the chief surgeon and must possess the confidence of their immediate general staff chiefs as well, else such details are useless to both. Medical Department questions arising within all sections

should come before these officers for comment before being finally decided. So much of all plans for the future as affect the Medical Department must, in confidence, be given these officers in order that the chief surgeon and his staff may be kept informed along lines where the commander in chief will expect him to obtain results. Only officers known to be trustworthy will be selected for such positions, and if not acceptable to both parties they should neither be detailed nor continued in office. But so long as they are acceptable they must be not only with the section but also a part of it and admitted to daily conferences.

It is understood therefore that such officers are detailed for the purpose of giving and receiving technical information with reference to the Medical Department and for the purpose of coordinating efforts thereof with the efforts of other departments and those of their own section. The mere fact, however, of the existence of such a detail must not be considered as precluding in any way the direct official intercourse which the situation demands between the chief surgeon, or, in his absence, his deputies, or his representatives within the armies or services of supply sections, and the respective chief of staff concerned.

The deputy chief surgeon at services of supply headquarters is a part of the office of the chief surgeon. In the absence of the chief surgeon, he directly controls that office and exercises technical control over the medical officers detailed as medical representatives with the general staff sections at those headquarters. When the chief surgeon is present the deputy acts as his chief executive in all matters pertaining to the management of the office or the supervision of Medical Department activities within services of supply sections, the latter function being exercised, of course, through the chief surgeons of the sections therein.

Relationships between the chief surgeons or surgeons, as the case may be, of groups of armies, armies, corps, or divisions, their medical representation with the general staffs of these units and the respective chiefs of staff, are exactly as has been indicated for the general headquarters and services of supply groups.

In the cases of army groups and armies, medical officers should be detailed to all sections of the general staff which are present at the headquarters of such units. With corps and divisions a representative with the administrative and supply section should suffice, and allowance for all such details should be made upon tables of organization of the unit concerned. Below the army group, these officers should be assigned to the general staff section concerned but should remain officers of the Medical Corps and not be detailed general staff officers.

Attention is invited to the linking up of the division surgeon and the commanding officer of the sanitary train and the division surgeon and the regimental surgeon. In the case of the former a hazy relationship has existed heretofore wherein the commander of divisional trains was in a position to exercise technical control over the sanitary train even when trains were not merely on the march and together as a unit. When on the march and acting as a unit the need of such road control is conceded, but all other technical and tactical control of the sanitary train must revert to the division surgeon when contact with the enemy is imminent. The commanding officer of the sanitary train is therefore one of the important assistants of the division surgeon, and the direct official intercourse so necessary to the proper functioning of the intradivisional evacuation system must be made possible and considered essential.^o Relationship of army, corps, or division chief surgeons or surgeons to the respective sanitary inspector deserves careful consideration. A status has slowly developed within certain larger combatant units wherein the sanitary inspector has been considered essentially a staff officer of the unit commander, with more or less independence of the chief surgeon or surgeon. The opinion is held that such assumption is erroneous and that this officer is an important assistant to the Medical Department head in question who, furthermore, must carefully supervise and control his activities in groups of armies, armies, corps, or divisions.

In the case of the regimental surgeon the status is quite different. The surgeon of a regiment must be a staff officer of the regimental commander, and as such he is his technical adviser on all matters medical or sanitary. He is therefore tactically and in all other ways directly under the regimental commander through his adjutant. This may be taken for

^o In the present organization the commanding officer of the medical regiment (sanitary train) also serves as division surgeon. The medical inspector (sanitary inspector) serves as his assistant.—Ed.

granted, and the linking up of these officers with the division surgeon is merely to indicate the technical supervision which must be exercised by the division surgeon over these juniors who are, morally at least, his assistants.

A carefully organized liaison must be maintained between the medical department of an expeditionary force and similar groups of allied armies with which our troops may be operating. Through such an organization a multitude of details will be handled. Officers of rank, experience and tact, speaking the language of the foreign office concerned, must be assigned these important details. It is highly important that these offices be so organized as readily to permit direct communication between them and the offices of the chief surgeon or his deputies. In the zone of the armies a similar status must exist. The direct communication referred to must be limited, of course, to technical subjects and matters of approved policy not requiring further reference to American or allied staffs.

The organization as presented above, therefore, is considered essential to the success of the sanitary service with an expeditionary force. Acceptance of such an organization will only duplicate, for combat units and their staffs, that which was in actual existence at general headquarters in France for more than a year, and will largely counteract the loss of efficiency developing for the Medical Department from the separation of the larger combat, headquarters into echelons and placing of the chief surgeon of an army, for instance, back with the second or third echelon.

By such a chain the chief surgeon, his deputies, and representatives with the fighting troops—in all of which positions the necessity for prompt information is great—may be kept informed regarding the expected activities, shortages, unusual occurrences, or the like. This information is essential not only that those interested may be duly advised, but also to preclude the loss of time which the usual channels of communication entail, such loss resulting only in useless suffering and a sacrifice of human lives.

In this plan of organization the army service zone has been incorporated, since it is believed certain that such an element will replace the advance section, services of supply, in any organization scheme adopted for an expeditionary force of any magnitude. This geographical division places the advance section within the zone of the armies and therefore under army control.

For the Medical Department the objective is to provide the means for relieving the group chief surgeon of the multitudinous duties attendant upon the supply, equipment, sanitation, discipline and training of the large numbers of Medical Department units and personnel making up the group command. The larger the force the greater the necessity for perfect liaison. Information and orders alike travel slowly in huge, dispersed commands. The medical service, by reason of its large establishments and the mass of impedimenta and transportation, requires time to be in a position of readiness. It must be apparent, therefore, that tardy information of any activity will eventuate in calamity and will detract from the success of the venture if not entirely nullify it.

II

OFFICE OF THE CHIEF SURGEON, EXPEDITIONARY FORCES

The chief surgeon of an expeditionary force, with the rank of major general, is a member of the administrative staff of the commander in chief, and his activities, in common with those of all other chiefs of services, are coordinated through the coordination section of the general staff, at general headquarters.

The office of the chief surgeon will be located at general headquarters, or at the headquarters of the services of supply, such location depending upon facilities and administrative convenience.

Should conditions prescribe the location of the office at headquarters of the services of supply, the chief surgeon assumes the dual function of chief surgeon of the forces and of the services of supply, and his activities are coordinated through the commanding general, services of supply and his general staff, but should he be located at an intermediate point he must have a deputy to perform the duties of chief surgeon of the services of supply. Even should his office be located at general headquarters, he must have a deputy at this point. The deputy at general headquarters is in perfect liaison with the chief surgeon's office

and with the chief surgeons of combat organizations, and while normally he advises the chief surgeon of policies promulgated by the general staff relating to the Medical Department and transmitted to him by the A. C. of S., coordinating section, he must be empowered to act in emergency for the chief surgeon, particularly in those cases in which the element of time is the determining factor, advising the chief surgeon promptly of the action taken.

The deputy at general headquarters must have assistants and a clerical force commensurate with the volume of work devolving upon him; and the chief surgeon, whether located at general headquarters or elsewhere, must have one or more representatives with clerical assistants on each section of the general staff in conformity with existing regulations, to the end that there may be effective coordination between the sections in their relation to the Medical Department.

The deputy at general headquarters is in a peculiarly favorable position for liaison with the armies of the expeditionary forces, and the location of the chief surgeon at an intermediate point, with a deputy at both general headquarters and the services of supply, places him in a most advantageous position, as this disposition leaves him free from the mass of routine in which he would be involved in another situation and affords him time for study of problems confronting the Medical Department and opportunity for personal investigation of the adequacy of measures both at the front and the rear.

Experience has developed the office and determined its division into sections and subsections as follows, a brief résumé of the scope of each being given:

1. *Chief surgeon*.—General control of Medical Department and policies dealing with the department at home and abroad.

2. *Deputy chief surgeon*.—Coordinating control of divisions of office, and acts for chief surgeon in the latter's absence.

3. *Deputy chief surgeon*: General headquarters; duties outlined in text.

(a) Medical officer attached to administrative section: Concerned with tonnage, forecasts and priority of tonnage, priority shipment schedules, organization and equipment and tables of organization, and authorized aid societies affecting the Medical Department and not under other sections.

(b) Medical officer attached to intelligence section: Concerned with intelligence of value to the Medical Department.

(c) Medical officer attached to operations section: Concerned with operations and in close liaison with deputy chief surgeon.

(d) Medical officer attached to coordination section: Concerned with hospitalization, transportation, evacuation, supply, troop movement, veterinary service, and in close liaison with deputy chief surgeon, general headquarters.

(e) Medical officer attached to training section: Concerned with training of medical personnel and inspection of same, and conduct of sanitary schools.

(NOTE.—These officers, except the deputy, must be members of the general staff and be regularly assigned.)

Close liaison between these officers assigned to staff sections facilitates the coordinating function of the deputy chief surgeon and accelerates the work of the chief surgeon and also that of deputy at the headquarters of the services of supply, thereby insuring promptitude in movement of personnel, transportation, and matériel to meet the requirements of military operations.

The division into sections and subsections of the chief surgeon's office, with duties assigned each, are as follows:

1. *Sanitation*.—A medical officer of the rank of colonel, with the proper number of commissioned and enlisted assistants, conducts this division, which is subdivided into the following sections:

(a) Sick and wounded: Deals with inspection, auditing, correction, and compilation of all statistical data relating to the sick and wounded and correspondence pertaining thereto.

(b) Sanitation, laboratories, and communicable diseases: Deals with general and special sanitary administration, laboratories, inspections, epidemiology, and sanitary reports, sanitary publications and reference library, and venereal disease control.

2. *Hospitalization.*—This large and important division would normally be under control of a brigadier general of the Medical Corps, with the proper number of commissioned and enlisted assistants, and subdivided into the following sections:

- (a) *Procurement and construction:* Deals with hospital projects, transfer of hospitals and property to the Medical Department and vice versa, offers of lands and buildings for hospital purposes, leasing of lands and buildings and the inventories and lease papers of same, hospital plans and construction in liaison with the chief engineer or with civil contractors, repairs to hospitals, sanitary appliances for hospitals, procurement and distribution of tentage, coordination with rents, requisitions, and claims bureau and Quartermaster Corps, reference maps and graphic charts of projects completed, under construction and proposed, and inspection and reports relating to above items.
- (b) *Administration and policy:* Deals with hospitals, boards, inspections, instruction, personnel requirements, regulations, war diary hospitalization section, coordination of administration with other divisions and sections.
- (c) *Statistical and liaison:* Deals with daily bed report of base hospitals and convalescent camps, weekly reports of all hospitals, monthly bed reports and authorization reports of all hospitals, statistical tables, liaison with chief quartermaster, office reference, care and location of Medical Department units arriving from the United States, installation of new hospitals transportation for new hospitals, instruction and assembly park for hospitals for nontransportable wounded, and assembly and shipment of same.
- (d) *Evacuation and transportation:* Deals with primary, secondary, and special evacuation of sick and wounded, collection of evacuable of class D, transportation and assembly of special classes of patients, estimates for basis of procurement of motor ambulances, hospital trains, motor cycles, etc., for Motor Transport Corps, liaison with Navy, troop movement bureau, armies, and general headquarters, records and statistics of evacuation, hospital train assignment, motor ambulance transportation, services of light railways and waterways, and liaison with railway transport service.

3. *Personnel.*—A medical officer of the rank of colonel, with the proper number of commissioned and enlisted assistants, conducts this division, which is of the first importance in that the function of all units of the expeditionary force depends upon its conduct. It is subdivided into the following sections:

- (a) *Army Nurse Corps:* A nurse of recognized executive ability is assigned as supervisor, for upon her depend the administration, policy, assignment, discipline, and replacements of the nursing personnel (female) and aides, if any, for the entire medical establishment.
- (b) *Medical Corps, Sanitary Corps, civilian clerical force, and enlisted men of the Medical Department:* The medical officer in charge of this section must possess an accurate file of all personnel of the Medical Department and civilian attachés, and his office concerns itself with assignments, orders, transfers, returns, personal reports, files, location, organization, and commissions.
- (c) *Promotions:* This section deals with correspondence relating to promotions, records of recommendation and subsequent promotion, and notification of promotion, and the officer in charge must be ever upon the qui vive to obviate injustice being done deserving officers.

4. *Professional services.*—This division must be in charge of a medical officer of the regular establishment with the rank of colonel, to insure an accurate knowledge of administrative routine, and he must also possess a wide knowledge of the professional qualifications of the large number of civilian practitioners in the United States who form the commissioned medical reserve in time of war, that assignment to duty with the greatest efficiency in performance may be made.

This office is in direct liaison with the personnel and administrative divisions, and should be empowered to issue orders involving the travel of medical officers, nurses, and enlisted men of the Medical Department selected to form surgical and medical teams to the end that these teams may be transported with the utmost dispatch to points where their services are indicated.

The officer in charge also is in direct liaison with the division of supplies to the end that equipment is supplied in proper amount for effective performance of function by the teams and surgical and medical staffs of hospitals, and is assigned a proper number of assistants and clerical help. He maintains a file and record system that enables prompt action to be taken at all times.

To insure efficiency he must be empowered to make personal inspections in all units of the expeditionary force.

This division is subdivided into two subdivisions:

- (a) Surgical.
- (b) Medical.

The surgical subdivision, under charge of a medical officer of the highest surgical attainments, is subdivided into the following sections:

- (a) General surgery.
- (b) Research.
- (c) Urological.
- (d) Orthopedics.
- (e) X-ray.
- (f) Neurological.
- (g) Ophthalmology.
- (h) Maxillofacial.
- (i) Otolaryngology.

The medical subdivision, under a medical officer of high professional attainments, is subdivided into the following sections:

- (a) General medicine.
- (b) Psychiatry.

It is imperative that each subdivision and section thereof be in charge of officers who are preeminent in that particular branch and who at the same time possess administrative ability. In addition to routine duty, these officers prepare the bulletins issued from time to time, announcing the latest approved methods of technique, for the information of medical officers of the expeditionary force, and give stated lectures on the same subject to each class of medical officers at the sanitary schools.

5. *Dental*.—An officer of the Dental Corps with the rank of colonel and with the proper number of commissioned and enlisted assistants conducts this division, which is in part administrative and in part technical, the former dealing with current reports and returns, records, statistics, equipment, personnel, schools, and supplies, and the latter with the teaching, apparatus and supplies of the complex branches of prosthetic and maxillofacial dentistry.

6. *Administration*.—This division is in charge of an officer of field rank, and he, with a proper number of assistants, conducts the office, which, for convenience, is directly in liaison with all divisions:

- (a) Records, dealing with numbering and filing of permanent records, receipt, and dispatch of official mail.
- (b) Administration, dealing with general supervision of entire force of chief surgeon's office, information, courier service, chauffeurs, orderlies, printing, and stenographic work.
- (c) Detachment, dealing with entire detachment on duty in chief surgeon's office, its records and reports, discipline, instruction and equipment, censoring of mail, office property, mess, and quarters.

7. *Supplies*.—This division is in charge of an officer of the Medical Corps with the rank of colonel who is accomplished in all branches of supply work and who with a proper number of assistants conducts the procurement, statistics, and distribution of supplies, and maintains a careful liaison with the medical officers detailed to the general staff sections dealing with tonnage and supplies at the various headquarters.

The office is divided into the following sections:

- (a) Procurement, dealing with foreign purchase, United States automatic, requisitions, and Red Cross medical supply activities.
- (b) Statistics, dealing with graphics showing locations and functions of depots, cables relating to supplies, records, personnel, and car movements.
- (c) Distribution, dealing with medical supply depots, inspections, controlled storage depots.

8. *Finance and accounting.*—This division is under charge of an officer of the Sanitary Corps, for he must be expert in all forms of auditing and accounting, subjects entirely foreign to the professional education of a medical officer.

With a proper number of assistants, and provided with the most approved time and labor saving mechanical devices for the work, the office is subdivided into the following sections:

- (a) Finance, dealing with disbursing, examination of money vouchers, examination of hospital funds, liaison, and final clearance, billing, financial reports.
- (b) Property, dealing with examination of property vouchers and returns.
- (c) Legal, dealing with legal reference and recommendations based thereon.

9. *Veterinary.*—This division will be under the charge of an officer of the Veterinary Corps of field rank. With a proper number of assistants, he conducts the office which deals with administration, personnel, supply, organization, statistics, construction, inspection, liaison, appointments, assignments, promotions, veterinary hospitals, and instruction.

10. *Organization and equipment.*—This is a new division, the necessity for creation of which has been manifested constantly throughout the late war and the lack of which has made it necessary for officers already engrossed to the fullest to put aside temporarily most important duties to perform this labor.

It is the duty of this division to study the equipment and organization of the Medical Department with a view to constant improvement, and this is based upon reports and observations concerning every unit of the medical service, new offices being recommended to meet conditions not contemplated and the abolition of others found to be excessive and of little importance, and modifications, increase or decrease in equipment to enhance efficiency.

Officers detailed to this division should be permanently assigned as long as they possess creative faculties and demonstrate ability, and promptly relieved upon evidence of failure in either. The division is subdivided into three sections, as follows:

Shipment schedules and tables of organization: This section prepares the priority shipment schedules with reference to units of personnel, keeps the schedules up to date and furnishes extracts thereof to the personnel and supply divisions in advance of their realization in order that the former division may be fully acquainted with expectations in personnel and units and that the supply division may prepare its tonnage forecasts, prepares recommendations for changes deemed necessary, and keeps up to date the existing Tables of Organization.

Maps, charts, graphics, and manuals: This section prepares and maintains the correctness of all maps showing the location of all Medical Department units, all charts and graphics dealing with the duties of personnel or the layout of any unit, and circulars announcing changes, revocations, or additions to the Manual of the Medical Department or other Medical Department service publications.

Hospital and combat equipment: This section studies the equipment of the medical service from all angles and makes comparison with that of foreign services, recommending such changes in any part of the equipment as will reduce weight or volume, increases efficiency, mobility and durability, and facilitate standardization. It must be provided with draftsmen, mechanics, etc., as the work is of a technical nature, particularly in the combat section. All modifications effected and accepted by the chief surgeon must be checked over to the hospitalization and supply divisions in order that these offices may keep their projects and schedules up to date.^a

^a An organization and equipment division under the title of planning and training division has been in operation in the office of The Surgeon General since 1919, and a corresponding division will be maintained in the office of the chief surgeon of any expeditionary force.—Ed.

ATTENDING SURGEON'S OFFICE.¹

Attending surgeons will be detailed for all large military headquarters within an expeditionary force. Officers so assigned will be field officers of the Medical Corps and must possess tact, administrative ability, and be well versed in the branches of their profession. A competent complement of commissioned and enlisted assistants, including dental surgeons, will be assigned to the attending surgeon's office.

The function of this office is to provide medical and dental attendance for the commissioned, enlisted, and civilian personnel forming the command of which the office is a part. Attending surgeons are members of the staff of post or headquarters commandants and as such will make necessary recommendations with reference to sanitation and schedules for the authorized sick calls and physical and medical inspections.

Boards of officers will be convened from time to time at the various headquarters for the purpose of conducting investigations which may be of the utmost importance. It is frequently necessary to have medical officers detailed to these boards for the purpose of conducting required physical examinations, and attending surgeons must be prepared to sit as members of such boards.

Sick calls will be held ordinarily twice a day for enlisted and civilian personnel. For officers, a morning hour sick call will be held daily. At other times officers will be permitted to consult the attending surgeon, or his assistants, as needed. One medical officer will be detailed for night duty at the office of the attending surgeon. He will be constantly on duty for emergency calls during the hours between 7 p. m. and 7 a. m. A well-organized eye, ear, nose, and throat clinic will be a pressing need in such an organization, and suitable personnel will be assigned this work.

Sanitary supervision of messes and disposal facilities connected therewith is a function of an attending surgeon. He recommends sites for the establishment of bathing facilities for officers and enlisted men, and subsequently keeps in close touch with the sanitation of these establishments.

Although the closest attention being paid to laundry and bathing facilities offers the best means of maintaining a command free from louse infestation, such infestations are certain to occur, and a power-driven, high-pressure disinfector, adequately manned, should be part of the regular quartermaster equipment of a large headquarters.

A regular course of lectures covering prophylaxis against and the danger of venereal disease, personnel hygiene, and sanitation will be arranged for all enlisted personnel of the command.

The establishment and supervision of adequate facilities for venereal prophylaxis within the environs of a military headquarters is an important duty of this office. These stations must be maintained within easy and natural reach of the men and will be distributed throughout the city in which headquarters are located, in number sufficient to meet the need adequately. One such station will be established near the entrance of each camp associated with a headquarters. Supervision of these stations, if delegated, will be delegated to a commissioned officer only, and their operation intrusted to the highest type of enlisted personnel. These men must be impressed with the great responsibility they bear in helping to keep their comrades free from venereal diseases.

It is frequently impossible for personnel connected with administrative and tactical staffs to avail themselves of opportunity for proper exercise, rest, and recreation. These men can rarely take advantage of leaves, and then only at long intervals and for short periods. Work within offices at a headquarters is intensive and often continued without regard to hours, and a tendency will exist for individuals to continue at such duties without due regard to health. A grave responsibility in this respect therefore rests upon the attending surgeon. He must use all known means to reduce to a minimum the effects of wear and tear, during work at high tension, upon officers and men of his command. He will find of material assistance in this work a small corps of trained masseurs who have been recruited and trained from among the enlisted personnel at large. These men should be attached to the attending surgeon's office for duty.

¹ The organization formerly alluded to as the "attending surgeon's office" is now known as the dispensary. The standardized unit of this type is the general dispensary. See Tables of Organization, 677-W.—*Ed.*

III

ORGANIZATION OF THE SANITARY SERVICE OF ARMY GROUPS, ARMIES, CORPS DIVISIONS, ETC.

ARMY GROUP

The chief surgeon of an army group is the adviser of the group commander upon all sanitary matters arising within the territory occupied by the armies and auxiliary forces comprising the group command, relating to both the military and civil population, his duties being largely administrative and, upon occasion, tactical.

He coordinates all sanitary administrative measures between the armies and grand headquarters; through his assistant, the chief surgeon, army service area, he sees to the sufficiency of sanitary personnel, hospitalization, supplies, and transportation within the group zone; he advises the surgeon of the zone in his immediate rear of the imminence of battle, that the latter may clear his hospitals of evacuable, and, through the coordinating section of the group command, causes a sufficiency of hospital trains to be garaged as near the front as conditions warrant. He announces to the chief surgeons of the armies and of the army service area policies authorized for the sanitary service by both the group and group command.

The chief surgeon, army group, forwards important communications upon sanitary subjects from the chief surgeons of the armies to the chief surgeon of the forces, but, beyond this infrequent usage does not conduct an office of transmittal. He maintains no office of record beyond keeping a loose-leaf file of communications of immediate interest and telegrams, but should examine and note requisitions and inventories of all lands, buildings, and matériel acquired from allied or civil sources and should forward them to the rents, requisitions, and claims bureau through the chief surgeon of the forces, that adjustment may be promptly effected when the use is terminated. He examines and forwards, after approval, to the chief surgeon's office all vouchers for purchases or personal service arising in the sanitary units under his immediate control.

He keeps informed of morbidity within the zone for both military and civil population, and when an epidemic arises beyond the power of subordinate chief surgeons to control, under the authority of the group commander, assumes charge and takes the necessary steps for its suppression. From time to time he makes personal inspections to assure himself of the correct performance of duties assigned army chief surgeons and other surgeons in charge of various sanitary details in both the military and civil establishments. He sees to the adequacy of medical attention and hospitalization for personnel attached to group headquarters.

When the group command assumes control of the armies for a tactical movement he prepares a sanitary paragraph of the battle order upon which the battle order of the individual armies is based; he controls activities of the auxiliary societies attached and all voluntary aid.

THE ARMY

The chief surgeon of an army is the adviser of the army commander upon all matters relating to the sanitary service within the zone of the army, his duties being both administrative and tactical.

Under the authority of the army commander he commands the evacuation and army field hospital, the medical parks and depots, and the army ambulance service through assistants assigned to direct these units; through consultants attached to this office during military activity, he directs the surgical and medical services of army units, corps, and divisions; he maintains liaison with adjoining armies through the medium of an officer of tact and judgment detailed for that duty.ⁱ He coordinates sanitary activities of all elements

ⁱ Normally each army surgeon will have under his immediate jurisdiction 15 evacuation hospitals, 12 surgical hospitals, 1 convalescent hospital, 1 army medical supply depot, 1 army medical laboratory, 4 medical regiments, and in addition requisite veterinary units for the care and evacuation of animal casualties.—*Ed.*

of the command; he sees to the sufficiency of personnel, transport, supply, and hospitalization within the zone of the army. He supervises the sanitation of the command and of the civil population within the zone of the army, personally assuming charge in any epidemic that subordinates fail to control, acting in such case with authority of the army commander. He directs establishment of evacuation and army field hospitals at carefully selected locations, and through his assistant, the director of the army ambulance service, applies ambulance sections and individual ambulances where needed.

He keeps in constant touch with the operations section of the army general staff in order that he may at all times be cognizant of contemplated movements, and, possessed of this knowledge, he prepares the sanitary paragraphs of battle orders issued from time to time in which it is clearly stated what evacuation hospitals are to receive severely and slightly wounded, medical, gassed, and neuropsychiatric cases, and the location of medical supply parks. He advises the chief surgeon of the group command of the imminence of battle, that hospitals to the rear may be freed of evacuable and hospital trains garaged as near the front as conditions warrant.

When the army is acting independently of the group command he advises the surgeon of the army service zone that he may clear his hospitals. He clears his evacuation hospitals of evacuable in a steady flow at all times, and especially when battle is imminent.

His operations are coordinated through the coordination section of the army in all matters requiring the sanction of the general staff of the army that are not routine in character. He promulgates the sanitary code of the army, reconciling it with any orders from higher authority. He maintains no office of record beyond a loose-leaf file and diary for current use, and index of commissioned personnel of evacuation and army field hospitals, the army ambulance service, the medical supply depot and parks, the corps and divisional medical staff, and the surgeons of army units. He transmits important communications from division, corps, and army unit surgeons going to higher authority relating to sanitary subjects, indicating his approval or disapproval. He does not transmit routine reports of divisions and corps, but does transmit sanitary reports from army units.

He approves or disapproves vouchers for authorized purchases or payments for personal services arising in army units, forwarding the approved vouchers to the office designated by the chief surgeon of the forces. He approves or modifies the maximum stock allowances of the medical supply depots of the army, forwarding a copy of the first one to the chief surgeon of the forces for his information. In any emergency he uses the telegraph freely, and, acting under authority of the army commander, takes steps to meet the emergency, and makes report of his action to proper authority. He sees to the adequacy of medical attendance and hospitalization for personnel attached to army headquarters. He controls the conduct of the army convalescent camp, through the senior officer on duty thereat. He controls activities of the auxiliary societies attached, and all voluntary aid.

The sanitary inspector must be an officer of experience in field sanitation and must be possessed of broad views, that he may separate theoretical from practical sanitation, as the former has no place in an army engaged in combat. He should make prearranged plans with the coordination section of the army for the employment of labor battalions or Engineer regiments in the prompt burial of human and animal dead, in the proportion of one or more battalions to each corps sector. While regulations and sentiment direct the burial of human dead by their comrades in arms, it is rarely possible for combatant troops to be so employed, and in spite of sentiment surrounding the dead fallen on the field of honor, there is no more depressing duty imposed upon combatant troops than paying the last tribute to their dead compatriots, nor one which tends to lower their morale to a greater degree. Human dead should be promptly interred in the vicinity of the place where death came, and the location and number of bodies, with names reported to an officer of the graves registration service.

Men engaged in combat in modern warfare have not the same sense of nicety in the disposal of excreta and waste, obtaining in back areas and in peace-time camps, and it is folly to expect troops in combat to even make a pretense of digging straddle trenches for the disposal of their excreta or to bury kitchen and other waste material. This being an irrefutable fact, it behooves the sanitary inspector not only to make provision for labor battalions to follow the corps and bury human and animal dead and to thoroughly police the ground

over which troops have passed but also to so instruct the corps and division sanitary inspectors that they may not make futile attempts to have combatant troops perform duties which military exigencies preclude and from which they should be relieved in the interest of the first consideration; i. e., defeat of the enemy.

The sanitary inspector should concern himself intimately with the sanitation of army units and troops not in combat and which should be held strictly to the standard of sanitation. He controls sanitary squads and locates them at points selected for the most efficient service, these locations of necessity being in rear of the divisional line in open combat, though nearer to the front in stable or trench warfare. Beginning in the training area, he should maintain constant search for "carriers," and all cooks and kitchen helpers must be subjected to thorough examination to discover typhoid or paratyphoid sources. He must see to the chlorination of all water for drinking purposes and have the water tested for chlorination sufficiently. In the presence of infectious diseases within the army zone he should see to the prompt disposal of the infected and to observance of the rules governing contacts and disinfection, and, in diseases disseminated by the mouth and nasal secretions see that patients are masked immediately under all conditions of transport and hospitalization. In case of friction or inefficiency arising in the sanitary service he should investigate and report his findings to the proper authority for adjustment.

Under instructions of the administrative section of the army, he makes stated sanitary inspections of the command, and under the training section of the army inspections of Medical Department organizations and units, his routine duties being under the army chief surgeon. Inspection of either line or sanitary troops conform to custom and the Manual of the Medical Department, and report is made upon the prescribed form.

Should his duties prove too onerous or too much time be required for their performance, he should request, through the army chief surgeon, the assistance of corps or division inspectors, or both, the work being divided in accordance with its importance. In the inspection of combat troops, great attention should be paid to the sufficiency of food for the front line and the means to insure its reaching there hot; to the measures for drying clothing and shoes, and to facilities near the front for bathing and disinfecting, the latter manifestly being impossible during open combat, with a constantly shifting line. All complaints of inadequate treatment in sanitary formations should receive prompt investigation, as also should shortage of necessities.

Procurement and distribution of medical supplies, management of army supply depots, and the functioning of the supply service within the zone of the armies is fully covered under the heading "Medical Department supply service."

The director of hospitals, under the supervision of the army chief surgeon, controls activities of the hospitals and makes tentative selection of location for future establishment for the approval of the army chief surgeon, having in mind protection from direct fire, accessibility to rail and wagon roads, water and suitability of terrain. He notifies the army chief surgeon when a hospital is prepared to function, or to close prior to change of location, so that the latter may notify the operation section of the general staff of the fact, which is immediately published to the command served by this particular hospital. He should charge himself with prompt establishment of telephonic communication between the hospitals and the main trunks, giving timely notification to the army chief signal officer. By constant supervision, and instruction if necessary, he should assure himself that evacuating officers thoroughly understand the prescribed method of evacuation by hospital train and the preparation of reports of evacuees for the coordinating section of the army and for the regulating officer.

Marked attention should be paid to the work of registrars in the preparation of statistical reports and the prompt completion and forwarding of case records with evacuated patients and of those dying in hospital. This office keeps a file of daily admissions for all hospitals, by class, officers and men separately; deaths, return to duty, and evacuations, which should be compared frequently with the daily report made by all corps and division surgeons and hospital evacuating officers to the evacuation officer in G-4 of the general staff, and also with a weekly report of train evacuations which should be made by the regulating officer. Data contained in this file serve as a basis for the final report of the army chief surgeon upon conclusion of a campaign.

The director of the army ambulance service controls the army ambulance park and the companies which make up the service,^k together with the repair unit, under supervision of the army chief surgeon. It is essential that the officer selected for this duty be familiar with motor ambulances and truck technic in order that he may supervise intelligently this very necessary part of the service. He should maintain a card record of every motor ambulance and truck in the service (the United States and motor numbers, and make), together with a card record of the personnel, both chauffeurs and mechanics, noting in brief their qualifications. Upon receipt of advice from the army chief surgeon the director of the army ambulance service assigns as many companies as are deemed necessary to divisions, corps, army troops, and evacuation service, making note of the length of time each company serves, as a guide to relief for rest and repair, the length of service to be contingent upon military conditions and not made for any stated period. During times of military stress this officer should maintain close liaison with the army chief surgeon and corps surgeons in order that he may, under authority of the army chief surgeon, increase the number of companies at points where the greatest number of casualties are occurring.

The director of army ambulance service maintains the sanitary courier service between sanitary units of the army and the army chief surgeon's office, using for this purpose the motor cycles of companies in rest, and upon request of the officer in charge of medical supply parks, he furnishes transportation for medical supplies or for emergency articles for the front. Location of the park is left to his discretion, subject to the approval of the army chief surgeon, and the vicinity of the central medical supply park should have preference. At all times he should instill into company commanders, and through them into drivers and mechanics, the vital necessity for esprit de corps so that the whole command may work for the common end—the rapid and careful transportation of the sick and wounded. In order to make this possible, vehicles should be kept in thorough repair and their cleanliness and immediate availability be insisted upon.

The adjutant of the service supervises the routine reports and returns demanded by existing regulations from the commanding officer of each company attached to the park and evacuation service, those serving with corps, divisions, and army troops making and forwarding theirs through the command to which they are attached. Each company commander should keep a record of the number of trips, the number of miles run, the number of sick persons, both sick and well, transported, making to the next higher commander prompt report of any abuse of ambulances, turning in to the ambulance service director this record upon completion of his detail. In case of abuse of an ambulance not meeting with swift action on the part of the next higher commander, the company commander should be authorized to make report of the occurrence direct to the director of army ambulance service, stating nature of the occurrence, date and time, with the names of witnesses, that the matter may be reported to the army inspector for investigation and action. The quartermaster makes requisition for rations for all personnel at the park and for clothing for the entire enlisted personnel of the service, and for spare parts, gasoline, and oil for every motor vehicle employed in the service, forwarding such requisitions through prescribed channels.

The assistants necessary for maintenance of the park should be officers of the Sanitary Corps selected for their knowledge of motor vehicles and who, with the mechanics for the repair of machines, are assigned by the chief surgeon of the forces, upon request made through the army chief surgeon. (See section on Army ambulance service.)

The officer in charge of correspondence and records performs routine duties prescribed by higher authority in orders from time to time, keeps the service records of the enlisted personnel attached to the office, prepares the daily statistical report for the adjutant general's office, and also transmits to him all statistical reports from army units received in the army chief surgeon's office.

The chief consultants assigned the army chief surgeon's office are ordinarily attached during campaign only, each coordinating the particular service to which assigned, down through the divisions and, under authority of the army chief surgeon derived from the army commander, directs the services, especial attention being given to perfection of technic and in-

^k The army ambulance service comprises an ambulance battalion from each of the four army medical regiments, and ambulance troops pertaining to medical squadrons of cavalry divisions belonging to the army.—*Ed.*

struction. These officers maintain no records beyond those necessary for a report of the services upon the completion of a campaign, for incorporation in the report of the army chief surgeon. They merely make recommendation where error is discovered, reporting the facts to the army chief surgeon for correction if subordinate surgeons fail to take action.

The furnishings and supplies of an army chief surgeon's office should be as meager as will be consistent with proper functioning and should be devoid of any matériel which would preclude complete removal in two 3-ton trucks upon a half-hour's notice.

THE ARMY CONVALESCENT CAMP ¹

(Numbered from 1 up)

When military operations are decided upon, the first duty of the group chief surgeon or the army chief surgeon, if the army is operating independently of a group command, is the selection of a site for the concentration of sick and slightly wounded of each army, to be located at the rear of the army combat zone in proximity to the replacement camp, and its prompt establishment, though independent of it. These convalescent camps should have a capacity of 10,000 for each army, the men to be housed in huts, buildings, or under canvas, and should receive sick and slightly wounded patients evacuated from army hospitals who are incapacitated for duty for a period of two weeks or less. They should also receive all venereal cases in the infective period.

These camps should be under medical control and the patients given such graded exercises as will improve their physical condition, healthful amusement being added in abundance to preclude depression. Venereal patients should be segregated within wire enclosures, partly for the protection of other occupants of the camp and of civilian population and partly for punitive purposes, their presence in 90 out of 100 cases denoting a breach of discipline.

The medical staff of a rest camp should be composed of men of mature judgment and great tact, as their knowledge of the young soldier and of his shortcomings is invaluable in the conduct of the camp and in the prompt selection of cases to be returned to duty through the replacement camp. Auxiliary associations will find in these camps a field for their activities and should be encouraged in all legitimate endeavors to promote the welfare and recreation of the men, all possible facilities being given them.

Attention to the perfection of kitchen and bathhouses is necessary, for both are important in recuperation. The men should not spend their time in idleness, and after finishing camp police duty, physical drills should be given under the guidance of an officer selected for his knowledge of these exercises. Drills being finished, as many men as possible should be bathed, these several activities occupying the morning hours. In the afternoon out-of-door games should be indulged in, under direction of a qualified officer, the men who were unable to get a bath in the morning being given opportunity to bathe after games are over.

For men not yet able to indulge in physical drills or sports, and for all in inclement weather, recreation and reading rooms should be provided. Disinfecting and laundry plants must be provided to render the men free from vermin upon admission, and not only to keep them clean but also to incline them to the desire for cleanliness. Drills savoring of military movements or of the Manual of Arms should not be introduced, the object being to promote physical and mental well-being and to take the men's minds from their disabilities and the environment at the time of disablement. This, of course, applies to the sick and wounded and not to venereal cases. Men suffering from venereal diseases are disabled through their own misconduct and not as a result of military activity, though they too should be given exercise and indoor recreation when off duty.

The venereal section should be a part of the camp and necessary guards furnished from permanent camp personnel. The section should house a thousand men, should be conducted by an urological unit and supplied with all facilities for the care of venereal cases. The location of these camps as regards distance from the army is of little importance if only a railroad is near. When a man from either the venereal or the convalescent camp is pronounced by an examining board as of class A, he is transferred to the near-by replacement camp for equipment, after which he is returned to his unit through the regulating station.

¹ The army convalescent camp is now known as a convalescent hospital, with a minimum capacity of at least 5,000 patients. See Tables of Organization, 285-W.—*Ed.*

ARMY AMBULANCE SERVICE

(Companies numbered from 1 up)

Experience demonstrated that the system so long in vogue of assigning to divisions, corps, and evacuation hospitals, ambulance companies of 12 machines each, while excellent in theory was wrong in principle and in fact, in that one company might have too great a burden to bear while another had too little and no opportunity was afforded either for rest or repairs. The system of pooling all ambulances into an ambulance service with 20 machines to a company, all under control of an army director of ambulance service who, in turn, was assistant to the army chief surgeon, gave the most effective service in that it made possible the assignment of ambulance companies to divisions, corps, and evacuation hospitals in sufficient numbers and also afforded opportunity for relief of the personnel and the repair of machines which other systems precluded.^m

The assistant director, army ambulance service, in charge of personnel, should be an expert in driving motor vehicles and should impart this knowledge to the ambulance company personnel to the end that every man may be made proficient. One man should drive while his partner is resting or doing orderly duty, so that the driver will at all times have unimpaired faculties. In the course of instruction—which should begin the day that a company arrives at an ambulance park—the rules of the road should be carefully taught, particularly observance of rules of circulation governing transit in the combat zone, and the correct methods of traction by truck or tractor when road conditions preclude progress alone.

The assistant director army ambulance service (in charge of equipment, transportation and repair) conducts the function of the repair unit and also instructs members of the company at rest in the use and care of the gas motor, methods of detecting loss of function in a part, and in the methods of making quick temporary repairs to engines and running gear while en route, company mechanics assisting in the overhaul and repair of all cars in their companies.

Motor ambulance companies for all requirements of the theater of operations should be supplied at the rate of eight companies per division from front to rear. Of these eight companies, three should be equipped with machines of the light type, all others heavy, and all companies should have 20 motors each, whichever the type.ⁿ A maximum of 10 per cent of ambulances will be needed as reserve. This estimate therefore requires 176 motor ambulances to be shipped per division to an expeditionary force, and the basis is not confined to combat divisions. Of the eight ambulance companies per division, seven companies per combat division will be required for the zone of the armies, including the army service zone, and one company per division will be required by the services of supply for base ports, hospital centers, base hospitals, etc. This number should be increased by the additional eight companies per division shipped for replacement or depot division which must accrue to the credit of the Services of Supply.

Ambulance companies attached to divisions normally transport the wounded from forward aid stations to the divisional triage or sorting station or to the other divisional hospitals. These companies function under direction of the director of ambulance companies of the division, and he in turn under control of the commander of the divisional sanitary train.

The corps surgeons should each be assigned four companies of heavy ambulances, three operating at a time while the fourth is resting and repairing, the companies being under control of the corps director of ambulance companies, the latter's activities being directed by the corps sanitary train commander. The function of these ambulance companies is the transport of the wounded from "triage" to the mobile surgical hospital (corps), in which duty in times of stress they are assisted by the companies assigned to evacuation hospitals, and from the mobile surgical hospital (corps) to the designated evacuation hospitals.

^m Twenty ambulances are now authorized for each ambulance company or ambulance troop.—*Ed.*

ⁿ Two types of field ambulances have been devised. The heavy provides a capacity for six patients lying, and the light for four patients lying.—*Ed.*

The machines assigned army troops are eight companies in number, of heavy type, permitting service with Engineers, Artillery, labor, salvage, and pioneer troops and the transport of the sick and wounded of these organizations to evacuation hospitals, and also rest and repair.

To an army of four corps of four combat divisions each the above assignment, which is the minimum for proper service, would give:

16 combat divisions (light cars, 48; heavy, 16)-----	64
4 corps (heavy cars)-----	16
Army troops (heavy cars)-----	8
Evacuation hospitals (heavy cars)-----	16
In reserve-----	8
Total-----	112

For the army just given, which totals approximately 675,000 troops, there should be 112 companies in the army zone. In addition to the eight companies in reserve there should be held at the ambulance parks a just proportion of the 10 per cent reserve of ambulances. These companies and extra ambulances will be necessary to insure prompt and easy transport and to preclude recourse to motor trucks to the detriment alike of the wounded and of troops remaining in the line.

Each machine should have a large white cross painted on its top and a red cross on the sides, the color of the ambulance being khaki, against which background the red and the white crosses are emphasized. The white cross on top is necessary for protection against enemy aircraft. All ambulances should be equipped with disk type of demountable wheels, with one spare wheel, complete with casing and tube, ready for use, as part of their equipment each. Running and head lights should have the red cross painted on the glass to insure free passage of the circulating route and to gain assistance of the military police in case of a road block.

A study of the various uses of the gasoline exhaust for the purpose of heating the interior of ambulance warrants the rejection of them all, and the simple thermosiphon was recommended. This thermosiphon requires only a small pipe leading from near the top of the radiator on one side back beneath the floor of the ambulance, where it is connected with a small coil, the return pipe running from the lower strand of the coil to near the bottom of the radiator on the side opposite the one on which the lead began. The coil should be located beneath a perforated disk, with a hinged cover to exclude heat when not desired. This simple appliance is really a small hot-water heating system acting under the double effect of expansion of water by heat and of gravity, and it requires but little mechanical ingenuity to install at small expense in any car. It affords an even heat, which is felt after a few minutes' running of the engine. In cold weather the car may be warmed quickly by filling the radiator with hot water or by running the engine a short time before patients are placed on board.

Each ambulance will carry four litters upon each side in racks, and in the top should be slung arm and leg Thomas splints, two each, to automatically replace those worn by a patient, the same kind of splint being returned to the hospital from which patient was received. This simple system insures a steady supply of splints to the front. Eight blankets and four hot-water bags or metal cans should be carried on each ambulance for replacements.

Experience on sandy roads of the Mexican border warranted the rejection of ambulance trailers, but these vehicles, identical with the ambulance itself minus the machine and steering gear, would have been of great value on the hardpan roads of France. Their further development must be considered.

In very muddy soil an ambulance may, on occasion, be stuck, and in such a predicament the services of a heavy truck, of a tractor, or even a tank must be solicited by the ambulance company commander, and with this possibility in view all ambulances, whatever their type, should be provided with a short towrope, with hooks borne on swivel joints at each end.

In addition to its repair truck, each ambulance company should have assigned to it one 2-ton or 3-ton truck for carrying supplies and the personal effects of the personnel, one trailmobile kitchen, and one water cart, the two last named to have roller-bearing axles to prevent the burning out of the running gear.

As ambulance companies usually camp in the vicinity of other sanitary units, their medical attendance can be provided by the nearest hospital; but every ambulance company should have a pannier filled with dressing packets, bandages, adhesive tape, iodine swabs, etc., for use in case of emergency.

The commanding officer supervises the preparation and forwarding of current reports and returns. He keeps a record of the number of patients or persons transported, miles traveled, the amount of gasoline and lubricating oil used, all in a small book, the data serving as a basis for his report to the chief surgeon of the army, through the director of ambulance service, upon conclusion of service period or of a campaign.

THE EVACUATION HOSPITAL

(Numbered from 1 up)

The evacuation hospital is the keystone of the sick and wounded system of a field army, and these units should be organized in the proportion of one for each division, this ratio being sufficient for the needs of army troops, it being recognized that at no time, except under the most unusual conditions, are all the divisions of an army in the line at the same time.

Evacuation hospitals must of necessity be movable units, capable of functioning in such buildings as exist in the zone of the armies or under their own tentage. They should be self-contained in the fullest sense, with a standardized equipment, and should have a capacity of 500 cots and 250 litters over and above the space occupied by permanent and temporarily assigned personnel, and are under the control of the army chief surgeon, through his assistant, the director of hospitals.

The assignment of evacuation hospitals to the care and treatment of special types of surgical and medical cases exclusively is unwise and even in fixed warfare is wasteful of personnel and transportation.

If terrain permits, these hospitals should be placed in pairs, each retaining independence of the other. This arrangement permits one to fill and close, the other one opening when the first closes, thus enabling the first one to deal with its quota and free itself of evacuees. If rail facilities offer, evacuation hospitals should be located as near as possible to a siding, for without this means of establishing a constant flow of sick and wounded to the rear they quickly fill and cause a reflex congestion in divisional hospitals; a condition which should never be permitted to arise. The sole departure which should be allowed from this rule would be the possession by the sanitary service of an adequate number of motor ambulances, motor trucks, and busses, in which evacuees could be transported to a second line or echelon of evacuation hospitals or to advanced base hospitals.

With the consent of military authorities (coordinating section, general staff, army) advantage should be taken of every railroad siding in the battle area to which the regulating officer can dispatch a hospital train without undue interference with supply trains, and no location should be definitely decided upon by the army chief surgeon without specific agreement with the coordinating section, as above, and the regulating officer, as to the availability of a siding for containing a hospital train for a specified loading schedule, and the number of trains allowed on this siding in a period of 24 hours.

In selecting sites for establishing evacuation hospitals the army chief surgeon should make a personal reconnoissance beforehand, or have a competent assistant do it, to determine the existing facilities as to railways, buildings, wood, water, ground space for the erection of tents, and safety from enemy fire, either direct or indirect. Having made a selection which receives the approval of the coordinating section, army, if the unit to occupy the site is on a railway and transportation is available, a request in memorandum form to the operations section, army, will produce the necessary order, which is accomplished by the troop movement bureau of the coordinating section, army; if beyond the limits of army

control, request made by the army commander upon general headquarters by wire will produce the desired result. Once within the army zone the transport of these units is usually made on trucks from place to place, as but small dependence can be placed upon available trains.

The average number of trucks of 3-ton capacity to transport an evacuation hospital is 50 for a single trip, so unless a long move is to be made it is economy to use not more than 20 at a time. This enables one portion to be made ready to function at the new location while the remainder is being transported. When the new establishment is prepared to receive personnel all the commissioned officers, except the adjutant and one or more assistants to superintend the loading, and the female nurses, should be transported in ambulances to the new location. A sufficient number of enlisted personnel with all but two cooks will have already proceeded there on the first trucks.

On assignment to a unit each commanding officer should immediately prepare a truck-loading schedule in such a manner that the equipment and tentage necessary for commissioned personnel and nurses, the cooks, surgical department, and lighting and heating units will arrive first at the new location. It is incumbent upon each commanding officer to familiarize himself with the amount of space necessary to contain the hospital when tentage is erected and to prepare a diagram to scale for each tent employed, whatever the make, and also of the application of tentage to buildings. Every officer and enlisted man of the permanent personnel should be drilled in this demounting and erection by schedule and diagram until that proficiency so essential in time of activity is acquired. The new location may not lend itself exactly to the prearranged plan, but in no instance is more than slight alteration necessary, and that in the wards. The receiving ward or triage should always be located at the opposite side from the evacuating section, and the surgical and bathing sections should be near the triage. By remembering this simple rule, novices will avoid much confusion.

Every hospital should be provided with a cross of white canvas, each arm $9\frac{1}{2}$ feet in length and 6 feet wide, to be pinned firmly to the earth, preferably on green grass—before any other detail is given attention. If no grass plot is available, black cinders or rock should be placed in the quadrants to make the white cross conspicuous. Investigation has proven that a white cross on a green or black background is far more conspicuous than red when viewed from the air, and gives perfect definition in pictures taken from airplanes. The adoption of this expedient saved many hospitals from enemy fire. The importance of placing this white cross before any part of the unit is erected lies in the fact that aerial observers take photographs in the daytime and bombing planes discharge their missiles by night upon any point indicated in the picture, unless this cross is observed, and as red does not show up in a picture the usual distinguishing mark for a hospital is useless for this purpose.

Upon assuming command, the commanding officer should prepare a loading schedule for rail transportation based upon the known weight of the hospital equipment in tons and also the cubic space occupied. This schedule should be that of the maximum equipment, which should never be exceeded, and also the space necessary for 3,000 rations to be taken by every evacuation hospital, as cars for personnel, including temporary teams, box cars, and flat cars, must be accurately determined and made a matter of quick reference. It is essential that a car be included in the string with end doors opening upon the personnel cars, for the installation of a range so that cooks can perform their duties en route and the train continue without stop for feeding the personnel.

An evacuation hospital should have the following departments:

1. Receiving, triage, or sorting.
2. Operating, for severe and slight cases requiring operation.
3. Dressing, for slightly wounded, not requiring operation.
4. X-ray.
5. Pharmacy, laboratory, and dental.
6. Mess: Patients, officers, nurses, enlisted personnel.
7. Office: Commanding officer, adjutant, registrar, quartermaster.
8. Supplies: Medical, quartermaster, and laundry.
9. Hospitalization: Medical, gassed, surgical.
10. Morgue.
11. Evacuating.

In times of activity the personnel should be increased by the addition of 12 operating and 2 gas teams, each operating team being composed of 2 surgeons, 2 nurses (1 anesthetist), and 1 orderly, and gas teams being each composed of 1 officer and 2 orderlies.*

Every unit should have 4 operating teams among its permanent personnel, so that with the addition of 12 temporary teams 8 would be available for intensive operations during a "push," the 2 sections relieving each other every 8 hours—which is the longest period that a team can operate with justice to the wounded. Two dressing teams for slightly wounded dressing and operating rooms are organized within the unit, these also relieving each other every 8 hours.

Two medical teams for shock work, each team composed of 1 officer, 2 nurses, and 2 orderlies, all trained in approved measures for combating shock, are indispensable during battle. Their personnel should be especially trained in transfusion.

Two splint teams, organized from the permanent personnel, are indispensable. Each team should have 1 specially trained medical officer and 2 privates, for the correct application of splints, 1 team for day and 1 for night duty. By splinting a fracture or an orthopedic case these groups relieve the operating team and save time that otherwise would be consumed in changing operating gloves and gowns.

At least two surgeons with the permanent or temporary operating teams should be proficient in surgery of the brain and eye, so that patients in each of these two classes may receive prompt and correct attention.

A medical officer of recognized ability, member of the permanent personnel, should be assigned as chief of the medical service and should so supervise the service that it will be prepared at all times to give correct treatment both to toxic gas cases and medical cases of all classes. He is also the assistant to the chief triage officer, the two working alternately and assisted by others detailed for this duty as required.

Two medical officers thoroughly versed in radiologic, fluoroscopic, and screen technic, one for day and the other for night service, with one or more assistants for each, and all members of the permanent personnel, should be assigned for X-ray work. Young men are preferred for this service on account of the long hours necessary during times of stress and also on account of the necessity for keeping X-ray records ahead of operating teams in order that no delay may ensue and throw a surgical team behind its schedule.

A medical officer proficient in wound bacteriology and in pathology should be assigned from the permanent personnel. His duties should consist primarily in routine bacteriological procedure, in making Dakin solution, in preparing smears from wounds to insure their control, and in performing post-mortem examinations in cases of peculiar interest, preserving such anatomical specimens as are deemed worthy of forwarding to the Surgeon General's office.

An officer of the Quartermaster Corps, preferably one with experience, should be permanently assigned to the unit, for a multiplicity of most important duties devolve upon this officer, who of necessity must be familiar with existing regulations concerning subsistence, clothing, transportation, heating, lighting, and equipment. He must also be bonded, so that he can assume the duties of disbursing quartermaster of the unit.

The registrar should be an officer of the medical administrative service, thoroughly familiar with the intricacies of the sick and wounded report and the necessity for correct and prompt preparation of statistical reports (A. G. O.), the notification required by the chief surgeon's office upon the origin of infectious epidemic diseases, the collection and forwarding of individual medical cards, X-ray plates and records, and histories of all cases evacuated, and the prompt forwarding of all records in case of death. He should report the status of the hospital every day as of 6 a. m. to the evacuation officer attached to the coordinating section, army, giving admissions, the number of surgical, medical and gassed patients, officers and men separately, the number evacuated and dead, and the number remaining as classified above, this report being made by telephone or courier. He should also keep a thoroughly posted diary giving data upon all movements of the unit, with orders, the number

* These teams have been provided for in an organization known as the auxiliary surgical group, which is assigned to general headquarters reserve, normally at the rate of one group for each field army. See Tables of Organization, 689-W.—Ed.

of cases admitted, designating them as surgical (the class being given by the nature and degree of injury); medical, the number and class being given; gassed, the number, specifying the kind of gas used, if known; the number of operations by classes; the number of evacuations, both sitting and lying, medical, surgical and gassed; the number remaining, by classes; and the number of dead, with name, cause, time, place of burial and grave number, the last being obtained from a member of the graves registration service, who should be attached to the registrar's office.

A mess officer, member of the medical administrative service and permanently assigned, assisted by three noncommissioned officers, is in charge of the various messes, keeps the records, and makes provision with the railhead officer for supplies.

On the successful service of the receiving ward or triage depends the successful function of the unit, and for this reason officers selected for this duty need to possess a knowledge of both medicine and surgery and the ability to make quick decisions based upon good judgment and diagnostic powers.

The clerical force should be gifted with quick perception and be capable of recording quickly the data noted upon diagnosis tags and field medical cards, such data being the basis of important statistical reports (A. G. O.). One member of this force needs to be a man of known probity whose sole duty should be the collection of valuables from unconscious patients, those in extremis or those who desire it, valuables being placed in small bags provided for the purpose and retained in the custody of the receiving officer. The patient should be given an itemized receipt which is placed in the field envelope, a duplicate of this receipt being attached or affixed to the bag of valuables. Care in this procedure will preclude the loss of valuables and unpleasant investigation and explanations, this system enabling each ward surgeon to secure and return to patients prior to evacuation the valuables receipted for. It also secures for the receipting officer the original receipt, which, with the duplicate, should be retained as part of the records as long as the unit functions and then transferred to the chief surgeon's office with other historical records.

Two evacuating officers should be detailed, one for day duty (the detachment commander) and one for night duty (a detailed assistant), each with a number of litter bearers from the personnel, the strongest being selected for this very exhausting duty, to the number of 40, all trained in the correct procedure in loading and unloading ambulances, trucks, and hospital trains.

Having received notice of the imminent arrival of a hospital train, these officers should ascertain the number and names of patients to be evacuated, medical, surgical and gassed, recumbent and sitting, officers and men separately, and should prepare the entraining list for the train commander, a duplicate of this list being sent to the registrar.

When evacuation by train is desired, these officers notify the coordinating section, army, of the fact, furnishing the information noted in the preceding paragraph, which the coordinating section transmits to the regulating officer, and the latter, having a daily report of the entire hospital bed status is in a position to know to which hospital in the rear a loaded train should be dispatched.

Evacuating officers of each unit should inform the regulating officer by telephone or wire twice daily of the the number of evacuable, officers and men separately, sitting and lying, of surgical, medical, and gassed.

When evacuation by ambulance convoy is desired, the evacuating officer ascertains the vacant bed status of the other evacuations or base hospitals in the immediate rear, and dispatches the convoy to the one mutually agreed upon, a list of cases by name and class being furnished. This information, with the name of the hospital receiving the cases, is transmitted both to the coordinating section, army, and to the regulating officer.

The chief nurse controls the activities of nurses and nurses' aides, assigns those with operating room training to the operating section, and others to ward service and diet kitchens. She keeps the nurses' records, preparing for the commanding officer's approval and forwarding the required reports.

A chaplain is indispensable, and selection should be made without regard to denomination. The duties are onerous and divided between religious ministrations and conduct of amusement features of the unit, the latter being very necessary for the relief of the dreadful monotony and sadness that soon pervade an active evacuation hospital during hostilities.

The cuisine of an evacuation hospital is second only in importance to the operating section, for the importance of diet in the treatment of wounded and gassed should not be underestimated. Two of the sixteen cooks assigned to an evacuation hospital should be competent diet cooks who, with the assistance of the diet nurses, prepare food for patients with capricious appetites and for those placed on liquid and light diets. Two rolling kitchens and five ranges, gasoline or No. 5, Army, should be supplied each unit, field ranges not proving a success in these units.

A laundry is absolutely essential to the proper functioning of a hospital, and particularly so in the case of an evacuation hospital as it is always situated in a region away from civil population. Experience demonstrated that a portable gasoline motor-driven laundry gives the best service for small, flat work, the main laundry of demimobile type with a linen exchange being established at the army medical supply depot. A laundry capable of washing 1,200 pieces of flat work per day needs the services of two enlisted men of the permanent personnel. A drying chamber can be easily extemporized.

Five mechanics, assigned permanently, should be attached to an evacuation hospital; one tinsmith, two carpenters, one plumber and one electrician. These are indispensable, for the amount of work required of them is enormous, and often a unit is unable to function properly for lack of them.

The remainder of the enlisted personnel should be assigned the usual police, mess hall, orderly, barber, tailor, telephone, quartermaster, record office duties, etc., but all should be trained in litter-bearer service.

The commanding officer should detail his assistant as fire marshal and the adjutant as assistant fire marshal, with the entire male personnel divided into (a) rescue squads, (b) fire-fighting squads, (c) salvage squads, all being drilled in their duties daily until proficient, and thereafter drilled once a week. In fighting fire in wooden huts or tents it should be remembered that blankets soaked in water and applied to the roofs and exposed sides of adjacent huts and tents is the surest method of isolating fire and preserving near-by structures. Every hut or tent should be provided with two fire extinguishers equivalent to Pyrene, and tubs, barrels, or buckets should be filled with water and kept close to each hut or tent.

The establishment of a post exchange at an evacuation hospital is unnecessary, as auxiliary societies perform the functions which pertain to this, and also establish recreation rooms or tents.

The receiving triage or sorting department should be one or more large rooms, if buildings are occupied, or a small hangar or several ward tents, if tentage is used. Capacity should be at least 60 litters, and rooms or tents should be warm. The receiving or triage officer, with the clerks, is located here, and upon admission of a patient the decision is made whether operative procedure is necessary or not, whether further antigas treatment is indicated, if assignment is to be made to a medical ward, to the shock ward, if the case can be evacuated, or returned to duty.

The patient's name, number, organization, diagnosis, and all the data necessary for a record are obtained here from personal interrogation and from the diagnosis tag and field medical card, or from the latter and questioning of those who accompany the patient if he is unconscious. Valuables are placed in a small bag, a receipt for them signed by the triage officer, and they are placed in a field envelope, duplicate receipt being affixed to the bag, the contents of which have been listed on both original and duplicate. All conscious patients should be informed that the hospital can not be held responsible for valuables left in the possession of a patient who refuses to take advantage of the facilities offered for their care.

If examination shows that operative measures are necessary, the patient is now transferred by litter, via the bath if conditions warrant, to the preoperative room, where his injury is reexamined and the case assigned to a team unless shock treatment is indicated, when the case is taken in charge by the shock team. If the triage officer decides that operation is unnecessary, the patient is sent to the dressing room for the slightly wounded, by way of the bathing and washing room, and after dressing and the administration of anti-tetanic serum, if not previously given, the patient is sent to the evacuation section, whether considered as suitable for evacuate or for a return to duty.

A case designated as gassed is sent to the bathing room and bathed with alkaline soap and solution as indicated, the clothing entirely removed, and in a fresh suit of pajamas assigned to a ward, if not to be evacuated; or if evacuable or to be returned to duty, sent to the evacuation section. Medical cases are disposed of similarly, and if an infectious disease is diagnosed the case is removed immediately to a ward set apart for such. In the event of epidemic respiratory diseases occurring in the Army area, the receiving officer should see that every case admitted is masked, to minimize infection.

One of the auxiliary societies may establish a light refreshment counter at the triage for the benefit of patients who may take light food and also for ambulance drivers and orderlies.

A large supply of litters and blankets and a smaller supply of splints should be kept, both day and night, near the entrance to the triage, under charge of a noncommissioned officer, whose duty it is to see that a blanket or litter or splint is returned to the ambulances for every one brought in with a patient. This is most important, insuring the automatic supply of these articles to front divisions. A sign should be conspicuously placed bearing the legend "Litter, Blanket, and Splint Exchange." The triage or receiving ward should also be conspicuously indicated, both day and night, as should all roads within a radius of 4 miles toward the front. This marking of roads leading to evacuation hospitals is the duty of each hospital, and for obvious reasons it should never be neglected. Road markers should be of metal, black bodied, with directions in luminous letters preferably, for the guidance of ambulances by night. All signs belonging to a unit should be collected when it moves to a new location.

The bath hut or tent should be floored with "duck boards," should have a drain either open or piped, as resources permit, and two so-called instantaneous heaters of the jacketed type, with 50-gallon tanks supported on iron tripods, each heater supplying eight shower heads, with a cut-off and the necessary pipe. There should be two heaters, one on each side of the middle, with two partitions of either board or canvas, one section being for the use of officers and nurses, the other side for enlisted men. Nurses should have exclusive use of the allotted section from 8 to 10 a. m., and officers from 10 to 12, as the wounded arrive in large numbers between noon and midnight. The importance of these bath units can not be overestimated. They are a necessity, not a luxury.

The dressing station for slightly wounded not requiring operation should be located in a tent or hut near the triage, and requires only simple provision: An operating table, a few benches, a small table for dressings—prepared and sterilized in the main surgical section—and the usual instruments and utensils found in dressing rooms. This section is under the charge of two officers with surgical experience, assisted by two men. If a wounded man is found not to have received a prophylactic dose of tetanus antitoxin previous to admission, it should be administered here and proper notation made on his field medical card.

The main surgical department should be divided into an operating, an X ray, and a preoperating section, the latter having shock beds adjacent. The preoperative section is either a portion of a hut or a tent fitted with litter racks upon which litter-borne patients may rest previous to operation. This tent or hut requires no furniture nor fittings except litter racks, but it should have a good heating stove. The adjacent shock ward should be heated at high temperature by a suitable number of stoves, even in warm weather, and litters containing patients should be placed on racks, a cradle of half-barrel hoops placed over each patient, a blanket beneath and over him, and heat from a small lamp or a can of solidified alcohol or a small stove conducted beneath the blanket by means of an elbow pipe. It is here that highly trained personnel thoroughly familiar with the treatment of shocked cases find their work, for patients' lives are always in the balance and it is essential that shock teams be prepared to administer Cannon's gum-salt solution or to transfuse, or both, as the case demands. After operative procedure it is often necessary to place a patient in this ward until it is safe for him to be transferred to a general ward.

The X-ray room or tent should be connected with the preoperative ward, and it is necessary to make provision in advance for darkening the interior either with black cloth or paper. The chief of the surgical service directs which cases are to have fluoroscopic or screen examination, for plates are used only in cases of peculiar interest or where accurate

localization is desired, it being essential that the X-ray operator make the quickest possible examination and record of findings, so that he may always be several cases ahead of operating teams and thus avoid any delay. It is a waste of time to examine clean perforating machine-gun and rifle wounds and it is only when the projectile has passed close to a bone or joint that X-ray examination is called for. Shell wounds, on the contrary, demand examination in every case, for in this class of wounds it is impossible to determine by visual examination the presence or absence of shell fragments in the deeper tissues. Cranial injuries also require plate record for the purpose of avoiding possible error at the time of operation and also to furnish a permanent record for those to whose care patients will subsequently pass. Whatever the method of examination employed, the operator makes a simple slip of his findings, this being affixed to the field medical card or diagnosis tag for the information of the operating team assigned to the case, a duplicate being retained for hospital records.

The main operating hut or tent should have at least eight operating tables down the center, a row of double shelves running the entire length of one side. These shelves should be smooth planks resting on folding horses, the upper shelves for holding sterile dressings, utensils, etc., and basins for lavage of the hands of those required to be sterile; the lower shelves for nonsterile dressings, utensils, etc. This row should be on the side next the head of operating tables, leaving the space between the foot of the tables and the side of the room or tent free for the passage of litter bearers. The use of the long shelves does away with the need for a multiplicity of small tables and increases available space. When a building with small rooms is occupied, the shelves being sectional are easily adapted to the space afforded.

Every operating table should have a brilliant electric light suspended over it, and these lights should be provided with a cone shade to prevent the dispersion of rays, particularly upward. As the major part of operating is done after nightfall, it is imperative that a black lining be applied to the entire interior of a tent, with hinged window flaps; or if a building is used, the windows must be made light proof, as otherwise an inviting target is offered to enemy airplanes. As stated under duties of personnel, each hospital should have 16 operating, 2 shock, 2 gas, 2 dressing, and 2 splint teams, of which 12 operating and 2 gas teams are supplied at the time of the unit's engagement in activity, by the director of professional services, upon antecedent request of the army chief surgeon. This arrangement affords 8 operating teams, 1 shock, 1 gas, 1 dressing, and 1 splint team for duty every eight hours, the longest period that a team may work on battle casualties with justice to the patient. There needs to be among the operating personnel at least one surgeon proficient in cranial surgery and one in ophthalmic surgery, in order that cases requiring special technic may receive the best treatment.

When an operating team has completed its work upon a wound of the extremities involving fracture or a joint, instead of wasting time and effort in applying a splint, the case is taken charge of by the splint team. They apply the additional external dressings and the splint on a table or a litter placed under rack in a corner of the room or tent, leaving the operating team free to proceed with another case. The dressing team is for service in the dressing room for slightly wounded.

Adjacent to the operating hut or tent should be the hut or tent containing the sterilizing apparatus. This should be simple in construction and adequate to the requirements of perfect sterilization of dressings, instruments, utensils, and water. Three autoclaves of 24-inch diameter and three stock pots, 25-gallon, with faucets, each with an iron foot base 9 inches high, a number of drums for dressings, and instrument boilers, all heated by gasoline burners of the Bunsen type, have been found adequate to all demands. With the assistance of 3 enlisted men, 2 nurses are sufficient for conducting sterilization. On account of the danger from fire the sterilization hut or tent should be separated from other units, but it should be connected with the operating section by a corridor covered with canvas and easily pulled down.

The supplies department, both medical and quartermaster, must be in charge of the quartermaster, who also manages the laundry and linen room. At least 3 noncommissioned officers and 14 privates or privates, first class, are needed to conduct this department, 2 of the men operating the laundry. This laundry should be run by a gas motor, the set consisting of washer, extractor, and tumbler, and it should be easily transportable.

Laboratory, pharmacy, and dental offices should be located together for convenience, and these require no special comment.

The hospitalization section, surgical, medical, and gas, should be as simply equipped as possible, cots with thin mattresses being used, each cot in the infectious wards being separated from those on each side by means of a triangularly folded sheet suspended, to preclude cross infection. Wards should be supplied with the necessary amount of beddings, towels, urinals, close stools, etc., and the nurse should have a small room or a corner screened off where a small stove can be installed for heating water, food, and for other purposes. For each bed there should be a head net, as flies in enormous numbers always appear in a battle area during the greater portion of the year and annoy patients exceedingly.

The morgue may be a hut or tent and should be furnished with light, four litter racks, washing facilities, and several galvanized-iron cans. The carpenter shop and lighting unit are also located in a corner of this tent or hut.

The evacuating section may be in huts or tents and should have racks for litters to the number of 250, and the simple furnishings of a ward. A few nurses and ward masters are sufficient for its conduct, as the majority of patients are capable of helping themselves to some extent.

Notice of psychiatric cases should be sent to the train commander in order that they be afforded such segregation on the train as possible, and infectious cases should be placed in the compartment set aside for such patients. Weapons of every sort must be taken from all patients who are to be evacuated and turned over to the salvage officer, the owners being informed of the fact. This procedure is most important if regrettable incidents are to be avoided. The entraining area should be placed under police control to prevent unauthorized persons from boarding trains and to regulate road traffic during the period of entrainment.

The salvage officer and his assistants find an enormous accumulation of Government property at the triage, bath and operating sections daily, and he has this listed according to service and taken to the nearest salvage dump or depot.

Next to litter bearing, the preparation of graves is the hardest duty which an evacuation hospital has to perform; and as the personnel is barely sufficient to meet strictly professional demands during a "push," it is incumbent upon the commanding officer to solicit aid from near-by labor troops, or enemy prison camps if the hospital is 25 km. behind the line, or in any other way to secure the personnel necessary to dig the number of graves estimated. For esthetic reasons as well as for the sake of morale it is necessary that the dead be buried promptly.

Evacuation hospitals should be permanently equipped with interphone systems. In every case the chief signal officer (army) must be advised of the location in advance and request for trunk connection made, as it is imperative that the hospital be in communication promptly.

Experience demonstrated the impossibility of an evacuation hospital functioning to the standard necessary unless equipped with a portable electric generator in duplicate for both lighting and the activation of the X-ray.² The acetylene flame is not the equal of ordinary illuminating oil, for it ceases to be of use after four hours, and the atmospheric jar of a field gun or bursting shell invariably extinguishes it. The triage, operating department, and offices at least should be electrically lighted, as the greater part of the work in these hospitals is performed at night.

Every evacuation hospital should be equipped with heavy painted canvas ground sheets on a basis of three to a tent, as it often is necessary to hurriedly erect tentage on wet or dust-covered ground, and timber for floors is seldom obtainable.

When a commanding officer receives orders to move to a new location it is his duty to ascertain as promptly as possible from the coordinating section (army) the railhead at which he will draw rations at the new location.

² A special electric generator and lighting unit for an evacuation hospital has been provided.—*Ed.*

THE ARMY MOBILE LABORATORY

(Numbered from 1 up)

The brief stay of the wounded in evacuation hospitals rendered laboratory equipment at first supplied these units very excessive, and for this reason the question of utility has been considered, with the result that marked curtailment of laboratory equipment has been effected, as explained above, under "Evacuation hospitals." The consensus of opinion was in favor of one large, well-equipped mobile laboratory in the proportion of one to an army, to be located in the vicinity of the army ambulance park and the army medical supply depot, for facility in supply and transportation.^a

Equipment should be elaborate enough for all requirements of field laboratory work and yet capable, even with a special ward tent, of being transported upon two trucks. As freedom from dust and dampness are important, advantage should be taken of existing buildings, tentage being used only in case of necessity, and personnel should be billeted. Messenger service for the collection of specimens should be furnished by the army ambulance park, use being made of ambulances and motor cycles of companies in rest.

THE SANITARY SQUAD

A sanitary squad is a small services of supply unit required in the proportion of two and one-half per division for the maintenance of sanitary apparatus and instruction in its correct usage, its members being familiarized with the routine of sanitary inspection in relation to the care of latrines, water supply, preparation of food, suitability of billets for occupation, the disposal of wastes, including horse droppings, diseases among the civil population, especially those of a communicable nature. Every member of the squad should be required to keep a thoroughly posted notebook with all the necessary information for the unit commander to make a report to the officer responsible for defects, with recommendations for remedy, and to sanitary inspectors if responsible commanders fail to take action.

In practice it is found that units within the zone of the armies function best under the chief surgeon advance section area. If these units are assigned to combat areas their activities may best be controlled by the army sanitary inspector. If such assignments are found necessary, one squad to each division gives a force sufficiently large to meet the requirements of the sector occupied. For administrative convenience the area should be divided into sections by vertical and horizontal lines, each section being assigned to a squad, which is held responsible for maintenance of sanitation within its particular section and also for the equipment installed.

The major portion of these units will be required in the services of supply at hospital centers, base ports, etc. It must be made plain to all that the duties of a sanitary squad do not contemplate the performance of police duty, as this is part of the routine work of troops occupying the area, and that the members of this squad are really inspectors and instructors. The sanitary squad is, however, responsible for maintenance of sanitary apparatus and to that end should possess the necessary tools and a suitable place in which to make or repair the simple appliances used in the field.

Upon detection of a sanitary defect that is remediable, the unit commander should inform the responsible officer, recommending the remedy, and only in the event of the failure of this officer to make correction should report be made to the sanitary inspector.

The commander of the unit should be both resourceful and tactful and should keep himself thoroughly posted upon all matters of sanitary and local interest, in order that he may be in a position to give full information to the commanding officers of newly arrived commands.

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^a An army medical laboratory of a mobile type is assigned to each field army. See Tables of Organization 28c-W. - Ed.

IV

BASE SECTION CHIEF SURGEON'S OFFICE

A medical officer with the rank of colonel will be recommended by the chief surgeon of the forces for the duty of chief surgeon of each base section. Officers so detailed should have had long administrative experience and should possess a thorough knowledge of sanitation and epidemiology. Selection for these positions should be made from among those of known organizing ability.

The size and importance of base sections vary with the port facilities which they contain and the rapidity with which the expeditionary force is reinforced. Development of facilities within base sections is dependent upon the distance from them to the fighting line. Establishment of a port within a base section may in itself constitute a combat problem, in which case the service of the rear will develop only as fast as is permitted by advancement of the combat forces. Unless a base section, and port facilities therefor, be taken over complete from an ally, it is reasonable to assume that these projects will develop gradually.

Base sections should be under command of a line officer, usually of the rank of brigadier general. Each base section should be organized along the lines of the services of supply group in general. The staff, therefore, of a base section commander consists of a chief of staff, a general staff, and administrative and technical assistants. The administrative, intelligence and coordination sections are the only sections of the general staff represented at the headquarters of base sections. The base section chief surgeon is a member of the administrative and technical staff of the section commander, and as such is his adviser upon all questions connected with the sanitary service of the section. The chief surgeon should be represented in the general staff sections by a medical officer detailed to the administrative and coordination sections. Officers so detailed should be possessed of tact and ability and familiar in all details with the organization of the sanitary service of the section and the stage of completion of the various projects connected therewith. These officers must be acceptable to the chief surgeon and to the chief of the general staff section to which detailed if they are to be of value to the staff and at the same time really represent the chief surgeon of the section. These officers are detailed for the purpose of giving and receiving technical information with reference to the Medical Department and under direction of the chief of the section they coordinate the work of their own departments with that of others. The officers should be members of the Medical Corps and not detailed to the general staff.

Just as the section in general is organized along lines similar to the services of supply, so the chief surgeon's office of a base section is organized in a manner similar to that of the office of the chief surgeon of the forces (q. v.). The chief surgeon of a base section should so organize his office as to be free to circulate, within the section, among his various and well dispersed activities. Not only is he responsible for the correct functioning of his office proper, but he exercises supervisory control over various Medical Department activities such as hospital centers, camp hospitals, the attending surgeon's office attached to headquarters, the embarkation-debarkation camps or centers, ambulance companies, sanitary squads, medical supply depots and storage stations, medical laboratories, veterinary units, leave areas, and the Medical Department detachments attached to the various services of supply battalions or regiments.

In the absence of the chief surgeon he is to be ably represented by his first assistant, who is in all respects his understudy. This officer will have been selected for the position by the chief surgeon from amongst officers of his own organization and preferably will be one who has had experience in several of the important divisions of that office. He should have the rank of lieutenant colonel and should be a member of the Medical Corps.

The administrative section of the office should be headed by a field officer of the medical executive service, assisted by the necessary noncommissioned officers and enlisted men. He assumes the responsibilities of detachment commander for the Medical Department enlisted men on duty in the office of the chief surgeon and should have entire charge of all transportation assigned to the office from the local pool. He establishes a complete office

of record, with all necessary blank forms, equipment and files. A mimeograph and an adding machine are essential items in this equipment. Within the record office there should be maintained a pool of stenographic and typist help for general use throughout the office. Reports, correspondence, etc., going to or coming from the various divisions of the office are transmitted through and coordinated by the administrative division of the office.

In addition to the administrative division the staff of the section chief surgeon consists of professional or technical assistants and those whose duties are largely administrative. Those of the former class are as follows: Foreign liaison; general surgery; general medicine; orthopedic surgery; supervisory dental surgeon; naval liaison.

The divisions of the administrative class are as follows: Personnel; evacuation; sanitation; hospitalization; property and finance.

Administrative divisions of the office are further divided into sections, the most important of these being the embarkation-debarkation service section of the sanitation division. Activities of this section will be covered, with personnel and organization thereof, under a separate heading.

TECHNICAL AND PROFESSIONAL GROUP

FOREIGN LIAISON

Should a base section be established upon allied territory, thereby making use of foreign ports, it becomes necessary to establish immediately a reciprocal liaison with the various groups of allied forces present. Through the central liaison office the chief surgeon of the forces should request the assignment of the requisite number of medical officers from the allied army concerned, detailing upon request of these forces officers from his own office to represent him whenever necessary with the allied forces in question.

The foreign officer detailed to assist the base section chief surgeon should be familiar with the details involved in a large embarkation-debarkation problem and with the organization and personnel of the local governing powers. All divisions of the office coming in contact with allied local military or civil functionaries should maintain close and tactful liaison with the foreign representative detailed to the office of the chief surgeon of the section. This applies particularly to the evacuation service and the sick and wounded and epidemiological sections in their relations with local boards of health with reference to the movement of communicable disease curves.

GENERAL SURGERY

An officer of the Medical Corps experienced in general surgical procedure should be detailed from the consultant body by the director of professional services, chief surgeon's office. It is the duty of this officer to standardize and supervise the work of general surgeons throughout the sanitary service of the base section. He is the adviser of the section chief surgeon upon all questions relating to general surgery. He is empowered to investigate the sufficiency of surgical personnel and matériel throughout hospitals of the base section, making necessary reports and recommendations to his chief upon completion of an inspection tour. In this work all consultants are expected to correct minor defects upon the spot, without recourse to correspondence. The granting of such authority, however, requires that only officers with mature judgment and tact be assigned the duties in connection therewith. Consultants should observe the results of triage in the forward hospitalization echelons by noting the percentages of cases arriving within base sections that properly should have remained within the zone of the armies. This procedure, with the necessary reports, will materially assist in the efficient administration of the sanitary service in forward areas.

GENERAL MEDICINE

The duties, jurisdiction, etc., of this office and that of general surgery are analogously constituted, differing only in the different nature of the professional work involved. It is the duty of the officer detailed to this work to carefully supervise the after-treatment of toxic gas cases. Should the number of cases warrant, assistants who are experts in psychiatry and diseases of the lungs should be assigned.

ORTHOPEDIC SURGERY

What has been said upon the duties, etc., of consultants in general medicine and surgery aptly applies to such a detail for the division of orthopedic surgery. Like all consultants on duty in base sections, the officer detailed to this work concerns himself with supervising the selection of cases for evacuation to home territory and to the rapid elimination of the unfit in incoming drafts prior to the necessity of hospitalizing such within the zone of the armies with attendant embarrassment of the bed situation in that zone. The consultant in orthopedic surgery carefully supervises and standardizes the methods of application of all orthopedic splints and appliances. He should observe and report upon all evident failures in this respect in areas outside of his section as indicated by the condition of such cases arriving upon hospital trains from the front, following active engagement of combat forces.

SUPERVISING DENTAL SURGEON

This division of the office should be under a lieutenant colonel of the Dental Corps empowered to act for the chief surgeon of the section in all matters relative to the maintenance of an efficient dental service throughout the base section and the hospitalization units contained therein. He investigates the sufficiency of personnel, supplies, and equipment and passes upon requests for replacements of both personnel and matériel checked over to him from the personnel or matériel divisions. He supervises the activities of the dental surgeons of outlying and detached organizations, insisting upon their proper performance of the required inspection of teeth of the members of incoming drafts. Base sections should have assigned to them an adequate number of dental surgeons to properly complete necessary reparative dental work on troops intended for forward areas, thus precluding, as far as possible, the necessity for other than emergency dental work with combat units at the front. The major part of this work should be done in the camps or centers of the embarkation-debarkation service, and equipment should be sufficiently elaborate to cover the need fully.

NAVAL LIAISON

A naval medical officer, a member of the staff of the naval port officer, should be detailed to act in liaison with the office of the chief surgeon of the section. This officer must be fully cognizant of the general situation at the ports and familiar with the needs of the Army and with the facilities which the naval authorities have to offer. It should be his duty to transmit information relative to the suitability and capacity, for patients, of all ships operating under naval control and having such facilities. Such data will clearly indicate numbers of the various classes of cases which can be transported.

When a board of officers is appointed to determine questions relative to suitability and capacity which may have become controversial, the naval liaison medical officers, with proper representatives of the chief surgeon's office, should be detailed to such boards. These officers should transmit to the proper office all details relative to the arrival, departure, destination, change in plans, etc., with reference to all patient-carrying transports. As it is manifestly impossible for naval authorities to maintain Medical Department personnel and matériel in sufficient amounts to care for all the sick on board ship, it is the duty of the naval liaison medical officer to transmit requests to the personnel and supply divisions of the office for additional medical officers, nurses, and enlisted men and for such supplies and equipment as may be needed to meet all conditions.

THE ADMINISTRATIVE DIVISIONS

PERSONNEL

The personnel division of the office should be under the direction of a field officer of the Medical Corps, assisted by one officer of the medical administrative service and by a member of the Army Nurse Corps acting as supervisor of the nursing service of the section. This force should be augmented by the requisite number of noncommissioned officers and men for the numerous administrative and clerical duties connected with the office. The division should be subdivided into sections dealing with orders and assignments, qualifications and classification, and records and reports.

The subsection dealing with orders is concerned mainly with drafting orders necessary properly to shift Medical Department personnel amongst the various activities of the base section. Chief among these assignments are those to naval transports above described. Should it be found necessary and possible to establish a Medical Department casual camp as a personnel pool, this unit will be administered and supervised by the section chief surgeon through subsections of the personnel division. Assignments and requisitions for replacements of personnel should be passed upon by the orders and assignments subsection, which will be assisted in that work by the detailed data relative to the classification, qualifications, etc., of the individuals concerned, compiled in the section devoted to this work. Routine reports, special reports, records, etc., relative to Medical Department personnel are prepared, filed, forwarded, or transmitted, as the case may be, by the office force of the records and reports subsection.

The supervising nurse maintains close touch with the entire nursing service of the section, including the facilities provided for the shelter, subsistence, amusement, and recreation of the members of the Army Nurse Corps. It is important that the nurse assigned to this important position be well equipped in tact and possessed of broad vision and knowledge of human nature if she is to succeed in a position fraught with so many difficulties and delicate situations. Every possible assistance should be afforded the various aid societies in their efforts to increase the comfort, and thereby the contentment, of the nursing personnel.

EVACUATION

This division of the office is responsible for the organization, maintenance, and supervision of the entire evacuation system within a base section. The chief of this division should be an officer of exceptional qualifications if he is to succeed in organizing and administering a service of this magnitude, and he should be a field officer of the Medical Corps. He should be assisted by two officers of the medical administrative service and the necessary number of noncommissioned officers and enlisted men of the Medical Department. In no other division of the chief surgeon's office is it so necessary to maintain careful coordination of the work with that of all other divisions as in the evacuation division. The work of this office is intimately associated with that of practically every other activity, and the development of a smoothly working machine requires the establishment of excellent liaison affecting particularly the professional and technical divisions and those of hospitalization, personnel, and sanitation (embarkation-debarkation service). The work of this office will be divided amongst the subsections of transportation, records, reports and statistics, and schedules.

The transportation subsection controls all Medical Department transport units such as ambulance companies, hospital trains, barges, etc., available and in use in the evacuation system. It makes all assignments of ambulances and motor-cycle side cars in accordance with Tables of Organization or equipment manuals, due consideration being given to available reserves upon these items of equipment. In cooperation with the records, reports, and statistics section, accurate card records should be maintained, covering transport units available. These records indicate the personnel assigned, United States numbers of vehicles or trains, location, periods of service, state of repairs, consumption of fuel, etc., and should be constantly kept up to date. All reports required by higher authority, and requisitions for replacement relative to transportation should be prepared in this office.

The statistical office consolidates information received in reports from the various offices of the base section relative to the subject of evacuation. Such reports are sent to it by hospitals and hospital centers and by the superintendents of the Army Transport Service and railway transportation office. After consolidation of this data the schedules section is in possession of information regarding cases for evacuation and concerning facilities available for accomplishing the movement. Necessary schedules are prepared and needed instructions for filling requisitions sent to the hospitalization unit affected. All transportation units concerned and railway or shipping offices should be notified at the same time concerning details of intended evacuations, train schedules, loading and unloading points, time of arrival or departure, and time and place of arrival and departure of the ship which it is intended to have used.

Where an ambulance service between hospital and ship or train is required, the necessary instructions should be issued by the transportation section following conference with the schedules section. Arrangements should be made within the evacuation division to organize and supervise the checking out of patients baggage, records, and valuables. If this be well systematized and carefully supervised embarrassing complaints will be minimized.

After final disposition of evacuees, detailed reports relative to evacuations should be made to the chief surgeon of the forces through the administrative section of the general staff of the base section. This data is used as the basis of cable reports to embarkation authorities in home territory.

Should there be patients requiring special treatment or consideration upon shipboard, such details should be taken up with the naval liaison medical officer for adjustment and the patients not evacuated until proper arrangements have been completed.

SANITATION

This division should be under the direction of an officer of the Medical Corps with the rank of lieutenant colonel, with organizing ability and trained in epidemiology and practical field sanitation. He will succeed largely through his ability to meet and get along with other officers not members of his own corps, and through his ability to handle men. He must, therefore, have tact and force and also possess vision and imagination. Officers who lack the elements of compromise should be detailed to such position only when their manifest advantages outweigh this serious shortcoming.

The officer in charge of the division of sanitation needs in his work the assistance of three district sanitary inspectors of the rank of majors, and the officers in charge of the various subsections of his office. The total personnel allowed this important division can be seen at a glance by consulting the organization chart for the section chief surgeon's office, and that for the embarkation-debarkation service section of the sanitation division.

The district sanitary inspectors are field officers of the Medical Corps. Actual organization of sanitary inspection work, including the districting of the section, supervision of sanitary squads, etc., is decentralized to these officers. They must completely cover the area to which assigned, carefully investigating water and food supplies, kitchens and mess facilities, ventilation and heating within shelter, bathing, laundry and disinfecting facilities, and, in general, the environs of all inhabited areas, civil or military, in a searching quest for either public nuisance or sanitary menace. Once discovered, the hygienic defect should be followed up with recommendations and repeated inspections until corrected. In this work sanitary squads are the assistants to district inspectors.

The subsections of the division are as follows: Food and nutrition; epidemiology; embarkation-debarkation service; urology; laboratory service.

The embarkation-debarkation service is covered by separate text under appropriate heading.

FOOD AND NUTRITION

This office is controlled by a field officer of the Medical Corps or the medical administrative service (allied science branch). He is assisted by an officer of the administrative branch and by the necessary enlisted stenographers. The officer in charge of the section should be a trained practical food expert, and his activities confined to organizations within the base section and to ships plying between home territory and the ports of the section. He should direct his efforts toward the practical improvement of all food and messing facilities and the conservation of foodstuffs, developing to the utmost the salvage of waste. His activities should not be confined to casual investigations and inspections, but he should give practical demonstrations and instruction in the kitchens of the various commands. Food and nutrition experts should be prepared at all times to decide questions arising in connection with the sufficiency of the army ration.

EPIDEMIOLOGY

This office is concerned with statistical records of epidemic diseases, the standardization and supervision of methods of control thereof, and those details relative to sick and wounded reports which it will be necessary for the chief surgeon's office to handle.

Through the office of the foreign liaison officer this office maintains liaison with the local health authorities, each reciprocating with necessary information relative to outbreaks of communicable disease and progress made toward the elimination thereof.

Charts and graphs showing prevalence, case incidence, location, noneffective rates and similar information with reference to sickness and injury of troops within the section are to be maintained in this office.

UROLOGY

An officer of the Medical Corps with known ability in the prevention and care of skin and genitourinary diseases should be in charge of this section. The detail will ordinarily be made by the director of professional services, chief surgeon's office, and the officer so detailed becomes the section consultant in urology, but he functions directly under the sanitation division, since his problems are so intimately connected with those of sanitation and hygiene. He standardizes the methods of prevention and treatment of all diseases under his specialty. He investigates fully all sources of infection and makes the necessary recommendations toward eradication of such sources whenever discoverable. He should maintain "spot maps" indicating cases and sources, and should be prepared to take the most energetic steps when unusual percentages appear in connection with any locality or command.

The section urologist should personally investigate the sufficiency and adequacy of both personnel and matériel for the prevention and treatment of skin and venereal diseases. Where shortage exists in matériel or there is inefficiency in personnel charged with this work, he should make report of the same to the chief of his division, recommending the necessary action. He should devote a considerable part of his time to the development and execution of a plan for liberal instruction of the members of the command with reference to the social evil and its connection with noneffective rates. Dealing as he does with a disease that walks by night, and confronted as he is at every turn by obstacles seemingly thrown in the path by Mother Nature herself, he needs to be fearless and bold if he would reap even a measure of success in his truly philanthropic task.

LABORATORY SERVICE

A trained laboratory expert who has had administrative experience should be detailed to the charge of this section of the sanitation division. He should be a field officer of the Medical Corps, assisted by one Medical Department sergeant. The base section Medical Department laboratory (stationary unit) should be attached to the office of the section chief surgeon, and the activities of this unit, its personnel, function, etc., supervised and coordinated through the division of sanitation. The laboratory service sub section acts as liaison between the director of laboratories of the office of the chief surgeon of the forces and the entire laboratory service within the base section.

All laboratory methods and technic should be standardized and supervised by this office, with the advice and assistance of the officer in charge of the section laboratory. The two should work in close cooperation with the other subsections of the sanitary division. Laboratory work connected with special sanitary investigations or of a routine character for all commands, other than hospital centers and base hospitals, are to be performed by the section laboratory. Units having laboratory facilities should complete their own examinations. Exception to this rule will be made, in the interests of uniformity in result, in the case of Wassermann reactions or of such other examinations requiring specialized apparatus or technic. This work should be carried on within the section laboratory.

From such data as it may possess the laboratory service should assist other divisions or sections of the office in the preparation of graphic charts dealing with epidemic diseases, etc. Routine reports, etc., required by the chief surgeon of the forces and higher authority will be prepared in this office.

BASE SECTION EMBARKATION-DEBARKATION SERVICE

Medical Department personnel attached to the embarkation-debarkation service at base sections is controlled through the division of sanitation. The service usually consists of one or more large concentration camps or centers conveniently located as regards the base

port. Each camp or center should be under the command of a line officer, he to have as a member of his staff a medical officer as the camp or center surgeon. The surgeon of an embarkation-debarkation camp bears the same relation to the commanding officer of the camp as a surgeon to the commanding officer of a garrison, with other duties imposed by the arrival or departure of troops and casualties. His duties are manifold and he must be both energetic and resourceful and should so organize his office as to be free from a mass of routine, and should employ his time in a supervisory capacity over police and sanitary activities of his camp. His office is organized with the following divisions:

ADMINISTRATION

This important division coordinates the duties of all office divisions, checks communications coming into or leaving the office, prepares all papers for the surgeon's approval and signature, and receives, distributes, and censors all mail. The administrative division is subdivided into two sections: Detachment, dealing with the enlisted personnel on duty in the office and the records pertaining thereto; mess, dealing with conduct of the messes for Medical Department personnel, enlisted personnel and, if conditions warrant, for officers as well.

DISPENSARY

This division conducts the pharmacy (which should be well stocked), maintains a place for holding sick call, the attendance upon which will be large by reason of the large number of troops arriving and departing (and in this connection a medical officer with the necessary attendants must be on duty at all hours), and is the location for the prophylactic station, which must be adequate and open day and night.

Space should be allotted within the dispensary for dental sick calls and treatment room. Dental officers should be provided in these locations without regard to rate per thousand. All possible emergency and reparative work must be completed here prior to troops leaving for the front or for home territory.

PHYSICAL EXAMINATION

This important division should be under an officer qualified in physical examination, the conduct of disinfection and bathing establishments, and the detection of venereal or other communicable skin diseases. His office is subdivided into the following sections:

Examining teams.—The duties of this section are of great responsibility in that it is the point at which the separation of the fit from the unfit is inaugurated and diseases that would be a menace to the forces in the advance detected, at the same time being the proper place for examining home-bound troops, to sort out venereals and those having other diseases which would be a menace to the homeland.

Bath teams, which conduct the bathing and disinfection establishments through which all troops bound for home must pass, and on occasion those arriving from the homeland, as vermin in wartime are found in abundance on all military routes of travel. This personnel also supervises the laundry establishment of the camp or center.

Train teams, which are concerned with meeting every train filled with the sick and wounded to be embarked, to examine all cases which give evidence of unfitness for further travel, and to render any medical assistance needed in case of sudden sickness or injury among arriving or departing troops. The personnel of these teams also accompany troop trains for the purpose of medical attendance.

Dock teams, which are primarily for detection of the unfit among arriving troops, and secondarily to render medical assistance to all at the piers, including crews of vessels if desired. In evacuations this personnel makes the last inspection of sick and wounded prior to their embarkation for home territory.

Venereal teams, which examine all incoming and outgoing troops for the detection of venereal and contagious skin diseases, and provides for the treatment of such cases as are detained, and for the immediate transfer of others to the designated hospital.

SANITATION

This division is concerned with the sanitation of the entire camp and its environment, policing being given special attention, since the last place observed leaves a lasting memory with those departing for home or for the front. Barracks, billets, huts, or tents must be maintained in a state of scrupulous cleanliness, marked attention being given to latrines, ventilation, and heating. Kitchens and mess halls should be inspected daily and sanitary defects corrected on the spot, under authority of the camp commander. Food handlers should be examined frequently for detection of possible "carriers." The disposal of garbage and waste should be perfect in every detail, as well as the disposal of manure, not only to prevent fly breeding but also to afford an object lesson in sanitary policing. Drinking water supplies must be well protected, and if chlorination is required, daily tests must be made for its sufficiency. Water and food containers must be perfectly cleaned daily. If the location is malarial or mosquito breeding, steps should be taken to eliminate the cause, if humanly possible.

HOSPITALIZATION

This division of the office of the base section chief surgeon should be under the control of an officer of the Medical Corps, with the rank of lieutenant colonel. He should be assisted by two other field officers of the Medical Corps and one officer of the medical administrative service. The officer in charge of hospitalization should be a man trained in hospital work in all its details, including those of the administrative and constructive branches as well as those of a professional nature.

In large expeditionary forces (two or more armies) it will be necessary to decentralize hospital control, except that of hospital centers, to the office of section chief surgeons, thereby relieving the chief surgeon of the forces of an infinite amount of details. At the same time this decentralized control should be exercised only in carrying out the policies of the chief surgeon of the forces, which will be, for the section concerned, part of a grand scale hospitalization plan. This office must therefore remain at all times in close touch with the mother group in the office of the chief surgeon of the forces. The division is organized into the subsections of inspection, construction, and retrenchment.

The inspection section is concerned with investigation of the administration, internal economy, discipline, efficiency, and supply of the hospital units within the base section. In so far as hospital centers are concerned, their control by the base section surgeon's office is confined to the supervision of their sanitation and to fire protection. In cooperating with the evacuation division this section investigates the efficiency of the evacuation system as developed by the individual units in an effort to further standardize all such activities.

New sites for hospitals will be inspected and passed upon by the section prior to their being recommended for acceptance, and in cooperation with the construction section frequent inspections and reports thereon will be made as construction upon these sites progresses toward completion.

The construction section is directly concerned with the completion of hospitalization projects authorized for this section. Plans prepared in the office of the chief surgeon of the forces and turned over to the constructing service for completion will be followed as closely as possible, but varying conditions in localities may demand that modification be made in these accepted plans. All such approved modifications will be reported to all offices concerned, and thereafter contractors or builders will be held to the new specifications.

Authorized repairs or additions to completed projects should be carefully supervised by the construction section and retained files of plans brought up to date in conformity with the change effected.

The retrenchment section prepares, in advance of need therefor, a systematic plan for the gradual reduction of hospital facilities within the section. This is of great importance when buildings and sites have been utilized within the territory of a foreign country, for upon conclusion of hostilities demands for such shelter are sure to be made, and for reasons of international comity, at least, these must be diplomatically received and considered.

When active retrenchment begins, this section takes over the function of transferring again to civil control, foreign or otherwise and in accordance with the prearranged plan, hospitals, buildings, sites, etc., as they can be spared and vacated.

In the case of transfer of buildings, equipment, etc., from military to civil control, the process must be formal and complete and will be accomplished in cooperation with the inspection section and the rents, requisition, and claims department of the services of supply.

PROPERTY AND FINANCE

A field officer of the Medical Corps, assisted by an officer of the medical administrative service and the necessary noncommissioned officers and enlisted men of the Medical Department, controls this division of the office of the base section chief surgeon. This force receives and visas all requisitions for equipment and supplies from Medical Department units or attached organizations within the base section.

Every base section should have at least one full stock issuing medical supply depot, under control of the section chief surgeon's office and established to cover local distribution needs. Upon the 15th and last days of every month these depots should render a complete stock-balance report to the property division. It should also be required that for its information a duplicate of all similar reports made to the central control office by base storage station be made to the section chief surgeon's office. Requests for initial equipment or other requests involving carload lot shipments of the heavier or bulkier items will be, whenever this is possible, visaed and relayed to "controlled stores," chief surgeon's office.

Requisitions from issue depots of the section must be passed upon in the supply division before being forwarded to the central control office in the office of the chief surgeon of the forces. Such requests may be filled either wholly or in part by diverting the necessary matériel, in original packages, from the stream of matériel flowing into base or interior storage stations. This contingency is provided for by blanket authority for such action to base section chief surgeons.

For the information of the central control office, the supply division will carefully supervise the management and stocking of base storage stations and the activities of Medical Department dock representatives, although for administrative purposes such organizations are directly under control of the supply division of the office of the chief surgeon of the forces. All correspondence, however, from this higher control to the storage stations, should, in the interests of good coordination, pass through the office of the section chief surgeon.

Under blanket authority this office should be permitted to approve emergency purchases of medical supplies or equipment up to a definite and fixed limit (usually \$250). This granting of authority presupposes due consideration being given stocks in depots, outside the section, before issuance of a request for the authority to purchase as "emergency." Such information is available by use of the ordinary means of communication.

With reference to finance, this office maintains liaison with the finance and accounting division of the office of the chief surgeon of the forces and should audit accounts referred to above under emergency purchases. Hospital fund statements should be examined, corrected and approved, and proper final disposition made thereof in this office. Should a medical disbursing officer be found necessary, he should be located and operate under the division of property and finance.

V

THE CORPS SURGEON

The corps surgeon is the adviser of the corps commander in all matters of sanitary interest arising within the corps, and controls under the authority of the corps commander the sanitary units assigned the corps through the commander of the sanitary train,^r his duties being both administrative and tactical; he prepares the sanitary paragraph of the corps battle order based upon the army battle order when the corps is operating under army control, and independently when the corps is operating alone.

The corps surgeon supervises the location of the mobile surgical hospital (corps), these locations having been previously tentatively selected by the director of field hospitals, due regard being given safety from direct fire, roads to front and rear, relation to divisions of

^r Each corps surgeon has under his immediate control 1 medical regiment belonging to the corps troops. See Tables of Organization 81-W.—Ed.

the corps in line of battle, water and fuel; he announces to the army chief surgeon and to the division surgeons the location of these mobile surgical hospitals (corps), and sees that the roads leading to them are conspicuously marked by signs both to the front and rear for the direction of ambulance drivers.

He transmits important sanitary communications from the divisions and corps troops to the army chief surgeon, or directly to the next higher medical authority in the absence of army command; he supervises the work of the division surgeons and sees that divisional units are correctly located for the most effective service; he concerns himself with the sufficiency of sanitary supplies, equipment, personnel, and transportation within both the corps and divisions; he maintains close liaison with the division surgeons operating under the corps on the one hand and with the army chief surgeon on the other.

He assumes charge of any epidemic within the corps area, under the authority of the corps commander, either among the military or civil population, and also within the divisional areas when the division surgeons fail in control, himself calling upon the army chief surgeon for assistance in the event of his resources being overtaxed; he directs the activities of the consultants assigned his office, and especially through the director of field hospitals, the activities of the mobile surgical hospital (corps) where the consultants find their greatest field of usefulness. He maintains no office of record beyond a loose-leaf file, and diary (data for his final report), and a card index of commissioned medical personnel within the corps or divisions of his corps; his office must of necessity be mobile and the furnishings so simple that all can be moved upon one 3-ton truck upon short notice.

The director of field hospitals and ambulance companies perform the same duties outlined for the divisions (q. v.), the director of field hospitals being mainly concerned with the conduct of the hospitals for nontransportable wounded in which duty he is assisted by the consultants.

The duties of the remainder of the office force are similar to those in the office of the army chief surgeon and need no comment.

MOBILE SURGICAL HOSPITAL (CORPS) *

(Numbered from 1 up)

In order to provide for the class of battle casualties known as nontransportable wounded it is necessary to provide a well-equipped, standardized surgical hospital that is easily transportable, and can be brought forward close to the division field hospital used as a triage, to provide prompt surgical care for these cases and obviate a long ambulance haul to larger hospitals placed of necessity further to the rear. The addition of a complete operating equipment to any division field hospital, besides being difficult of transport with a division, offers the further objection that once the hospital receives severely wounded it becomes immobilized. In order to properly function and to keep contact with the division the field hospitals must not lose their mobility.

There has been provided, therefore, for the nontransportable wounded, one modified field hospital, with standardized X-ray, electric lighting, sterilizing, and surgical equipment in the proportion of one of these surgical hospitals for each combat division in the corps.

Experience has effectually disposed of the fetich born of the long period of indecisive trench warfare to the effect that a wounded man must be immediately operated upon. Adherence to this idea can only result in the unnecessary death of many, since the shock of operation will be superimposed upon that of trauma. The question of how far a wounded man may be transported with safety is an open one, but if rest and shock treatment be given before the journey is begun the man will bear transportation to the mobile surgical hospital (corps) where facilities obtain for further shock treatment if necessary, and the majority of cases will arrive in condition for early operation.

To each corps there is assigned a medical officer of the rank of major as a director of the mobile surgical hospital (corps). He will be under the direct orders of the corps sanitary train commander, or, in his absence, the corps surgeon.

* Surgical hospitals are army units placed at the disposition of the corps surgeon for the purpose outlined under this heading. See Tables of Organization 284-W.—*Ed.*

Each mobile surgical hospital (corps) is commanded by a medical officer of the rank of major who functions under the immediate orders of the director of the mobile surgical hospital (corps) or, in his absence, under the orders of the corps surgeon.

These mobile hospitals are sent to the army area to be under the control of corps surgeons. They will be provided in the proportion of one to every combat division in the corps.

These hospitals are placed in the corps or division area according to the orders of the corps sanitary train commander to the director of corps field hospitals, to be located where they can provide immediate care for the divisional nontransportable wounded. They will be placed as close to the division triage as possible. They must not be placed too far forward when there is a possibility of a sudden retreat, and care must also be exercised that they are not placed in direct range of enemy artillery.

The evacuable operated wounded are transported to the evacuation hospitals from the mobile surgical hospital (corps) by ambulance companies under orders of the corps surgeon, assisted by the army ambulance service assigned to evacuation duty when requested.

The surgical consultant assigned to the corps is responsible for the proper performance of the surgical work in these hospitals.

If the departure of divisions from the corps area leaves an excess of mobile surgical hospitals (corps), the fact will be reported by the corps surgeon to the chief surgeon of the army, who will issue orders for the proper reassignment of the hospitals.

These hospitals, being designated in the battle order for the reception of nontransportable wounded, are expected to receive only that class of casualties. Should poor triage in the divisions result in sending transportable wounded to this hospital, report will be made at once to the corps surgeon for its correction.

A mobile surgical hospital (corps) should have the following departments: (1) Receiving, triage or sorting; (2) shock ward; (3) X-ray department; (4) operating room; (5) pharmacy, laboratory, dental; (6) mess (patients, officers, nurses, enlisted personnel); (7) evacuating; (8) office (commanding officer, adjutant, quartermaster); (9) morgue.

For the general functioning of the hospital see the part on the evacuation hospital, the organization and work of the surgical department there being similar. The mobile surgical hospital (corps), under canvas, will occupy 22 tents and will have a capacity of 250 patients.

VI

THE DIVISION SANITARY SERVICE

DIVISION SURGEON

The surgeon of the Infantry or Cavalry division must have the rank of colonel, and the officer selected for this duty must not only be energetic and zealous but possessed of tact and a broad knowledge of sanitary tactics and administrative duties.

He is the adviser of the division commander upon all questions of sanitary interest, and in his administrative capacity controls the sanitary activities of the organizations and units composing the division and the activities of the voluntary aid associations attached.

He inaugurates and maintains a schedule of training for the entire sanitary personnel of the division, and this schedule should be begun when the division is formed and continued to the time of entry into combat.

He maintains no office of record beyond a loose-leaf file, diary, and card index of the sanitary personnel of the division.

All official communications relating to the sanitary service, whether to or from the organizations and units of the division, are referred to him for action. He is responsible for the prompt and accurate preparation of casualty reports and the inspections of the divisional organizations and units to insure preparedness for combat and compliance with sanitary regulations; he systematizes and maintains the entire sanitary service for such medical and surgical care as the divisional facilities afford the sick and wounded and provides for the necessary transportation to insure the prompt evacuation of all cases in a condition to bear transportation; if suitable buildings exist, he will assign such equipment and personnel as are necessary to convert the buildings to hospital use, in this manner conserving his tentage; he makes provision for the disposition of the sick and wounded of the division on the march,

in training, and in combat, making use of all facilities to free the command of noneffectives and maintains the entire sanitary service in the highest degree of mobility; he is responsible for the timely rendition of requests for replacement of personnel and requisitions for matériel, which includes those for transportation.

To be in perfect liaison with the general staff of the division the division surgeon must have a medical officer detailed who will be attached to the administration section where he will be in a position to gain accurate information of all matters relating to the sanitary service and transmit this information promptly to the division surgeon, whose engrossing duties do not permit him to remain in an office during combat.

The sanitary paragraph of the battle order is prepared by the division surgeon and based upon the corps battle order unless the division is operating independently, and submitted to the division commander for approval and incorporation in the divisional battle order. This memorandum will show the location of the aid stations, the triage, the field hospitals, the ambulance companies, the litter bearer battalion, and the medical supply dump, the plan and routes of evacuation to the aid stations, triage and field hospitals, and the disposition of cases as sick, wounded, or gassed. If time affords, a road sketch showing the above data should be prepared and submitted to the division commander and the corps surgeon, though the latter must always be given the location of the divisional aid stations and sanitary units in either a formal or informal manner to insure coordination with the sanitary service of the corps.

During combat all changes in location of the divisional sanitary units must be promptly notified to the corps surgeon, as must also preparations for an advance or retreat, and this information must be sent by a trusted officer who is personally known to the corps surgeon and who must be prepared for this service at all times.

The division surgeon must see to the enforcement of orders to the effect that all ambulances carry a sufficient number of blankets, litters, splints, hot-water bags, etc., to replace those taken from the aid stations with the sick and wounded, and that the triage and field hospitals maintain a supply of similar articles to replace those turned over by the ambulances to the hospitals with the patients, in this manner insuring automatic replacement.

In campaign there are assigned to duty with the division by the director of professional services, medical officers of the consultant body who will be known as division consultants. The services represented are psychiatry, orthopedics, toxic gas, and urology, the first three finding their greatest field of usefulness in combat at the triage to which they are assigned by the division surgeon; the last concerning himself with the prevention and treatment of venereal and skin diseases in the entire command.

During the training period these officers give instruction to the medical personnel of the division; the psychiatrist making examinations to detect mental or neurotic cases with a view to prompt elimination, and during combat, while on duty at the triage, he differentiates the genuine war neuroses from the false, and in proportion to his ability and zeal conserves to the combatant troops many men who are malingerers, hysterical or extremely fatigued, and who may be returned to the line after a few hours of rest; the orthopedist institutes measures to prevent "trench foot," makes the examinations for the detecting of and prescribes treatment for genuine flat feet, trains the sanitary personnel in the application of splints, and during combat while on duty at the triage superintends the readjustment of application of splints; the toxic-gas officer instructs the entire personnel of the division in the effects of toxic gas, in the proper use of the mask and in the preparation of a dugout to exclude the gas, and the sanitary personnel in the means of combating the effects of gas, particular instruction being given the personnel of the field hospital set apart for the treatment of toxic-gas cases; at the triage during combat he differentiates real from false cases irrespective of previous diagnosis before reception, and recommends the disposition. The commanding officer of the field hospital, acting as a triage, must be possessed of great diagnostic ability, for upon him and the consultants assigned to the triage during combat rests a great responsibility, the triage being the sorting place where the real sick and gassed cases are separated from the false, and the wounded are classified for disposition. Faulty triage will inevitably cause overwhelming of the evacuation system and a reflex congestion at the triage and field hospitals besides greatly affecting the morale of the division.

Upon receipt of a movement order, whether by train, truck, or marching, the division surgeon prepares a schedule for submission to the division commander in which is detailed the position of the sanitary units on the march or by train or truck and the provisions for hospitalization of the sick and wounded to remain or be transported, these latter details being also transmitted to the corps surgeon or in his absence to the army surgeon.

DIVISION SANITARY INSPECTOR

To each division is assigned a medical officer of the rank of major who is concerned with the sanitation of the division, and the officer selected for this duty must possess tact, experience in field sanitation, and be well versed in epidemiology.

He makes the sanitary inspections of the entire division, whether in training area, on the march, or in combat, and also, when so directed, makes the required inspections of sanitary troops attached to regiments and smaller units and the sanitary train to determine the discipline, instruction, and sufficiency of supplies, equipment, personnel and transportation, reporting his findings upon appointed forms to the division surgeon; he instructs the entire sanitary personnel in sanitation and assists in every way to maintain sanitary perfection; he concerns himself intimately with the preparation of food, the cleanliness of kitchens and appliances, mess halls, handling food, which he has had examined by the bacteriologists for the detection of "carriers"; he investigates the quality, sufficiency, and variety of food and makes recommendations for modification or improvement; he investigates the availability of bathing and clothes-washing facilities at approved locations if none obtain in the area, making suggestions for improvisation if standard types are not available; he investigates the question of disinfection and disinfestation, and drying of clothing, recommending such number of disinfectors or disinfestors and dryers as may be required, and if unobtainable suggests improvisations; he investigates and reports to the division surgeon the incidence of any infectious or communicable diseases and the means taken to prevent their spread.

He investigates and makes report upon the venereal status of the command and makes recommendations for the prevention, care, treatment, and disposition of these diseases; he makes constant inspection of the prophylactic stations and investigates their conduct and the frequency of use in relation to the prescribed physical inspections and prevention of venereal diseases; he investigates the type, adequacy and management of methods for the disposal of liquid and solid garbage and manure, and makes recommendations for modifications or improvements; he concerns himself intimately with the disposal of liquid and solid human excreta and makes recommendations for a standard system in the training area, on the march, and in combat; if the command is to be billeted, he makes arrangements with the civil authorities for sanitation during the period of occupancy, and concerns himself with the adequacy and potability of the water supply; he has all sources of drinking water placarded as potable or unsafe as the case may be, and investigates the use of Lyster bags, the cleanliness of water containers and whether the water is chlorinated, frequently submitting samples for testing for the sufficiency or excess of chlorination; he investigates the sufficiency and adequacy of clothing and the proper fitting and preparation of shoes, the facilities for drying clothing and shoes, and the care of the feet.

The sanitary inspector investigates police adequacy, and the suitability of houses, barracks, or tents for occupancy, pays particular attention to heating and ventilation, and makes recommendations for repair or improvement; he searches for fly or mosquito breeding places and takes steps for their elimination; he precedes the command whenever possible to a new location to familiarize himself with all conditions relative to sanitation, and prepares his recommendations for any improvements indicated; in combat he concerns himself with the supply of hot food for the troops and the cleanliness of containers, policing of the battle ground, and the interment of the human and animal dead.

THE DIVISION DENTAL SURGEON

The division dental surgeon acts in a supervisory capacity over the dental surgeons of the division, all reports of dental work being consolidated by him for transmittal; he sees to the sufficiency of dental supplies and equipment; he requires that periodic dental examinations of the command be made and records kept of the necessary dental work to be performed,

and the immediate dental examination of and reparative work to be performed upon any recruit joining the division; he makes provision for dental treatment of the personnel attached to division headquarters, and, upon notification, for the personnel of the division supply train. The mobile hospital receiving the nontransportable wounded of the division will be provided with dental attendance by the division dental surgeon or one of his assistants.

THE DIVISION SANITARY TRAIN

The sanitary train of a division is composed of four motor ambulance companies (three light and one heavy), four motorized field hospitals, one litter bearer battalion, one medical supply unit, and one laboratory unit, the train being under the command of a medical officer with the rank of lieutenant colonel, who must be experienced in Medical Department administrative and tactical duties.¹

The sanitary train of a division is technically an integral part of the divisional trains, which are under the control of the division commander of trains. This control, in so far as the sanitary train is concerned, extends only to march and road control while the trains are together and marching or camping as a unit. When combat is imminent or when the sanitary train is detached from the other trains, all control, either technical, tactical, or administrative, reverts to the division surgeon through the medical officer in command of the sanitary train.

All communications concerning the units of the train pass through the office of the sanitary train commander. The train commander by frequent inspection insures the preparedness of the units for combat duties; he directs the movements of the train in compliance with orders, and in combat exercises assumes direct command over the units and coordinates their functions in relation to the battle order; when possible he precedes the train to a new location and makes a reconnaissance, reporting his observations to the division surgeon, if time permits before the entrance of the division into battle, he, in company with the director of ambulance companies, makes a study of the battle terrain, and reports his recommendations to the division surgeon concerning the availability of locations for the establishment of the triage and field hospitals, due regard being given to existing houses, fuel, water, and roads both to front and rear; he consolidates the supply of the train and provides for the necessary transportation from the divisional railhead to the units; he maintains perfect liaison with the regimental surgeons and the division surgeon during combat; all requisitions for supplies, spare parts, etc., for the units are transmitted by him to the division surgeon, and all requests for replacements in personnel and transportation; he provides the transportation for the litter bearer battalion when the exigencies of service demand quick transportation to a given point.

THE TRIAGE OR SORTING STATION

It is the duty of the Medical Department to retain effectives at the front by preventing those who do not require more than slight medical or surgical care from going to the rear, and to promptly evacuate the noneffectives without interference with military operations.

Triage or sorting begins at the front and continues through the entire chain of sanitary formations. Improper triage causes a loss in effectives through permitting men with slight or no disability to leave their units, and not only causes congestion of the evacuating system, but lowers the morale of the troops.

Correct triage insures the proper and prompt disposition of the sick and wounded in the hospitals designated for their reception and treatment, and a constant uninterrupted flow of evacuees to the rear.

It is poor policy to retain in the divisional and corps areas cases requiring more than a very brief hospitalization, for this practice immobilizes the hospitals and increases the supplies and matériel which can only be transported by an unwarranted tax upon the supply train.

The triage, which is in reality the receiving ward of a field hospital, is located as near the front as conditions permit, due regard being given accessibility both to the front and rear, and to this point all the sick and wounded are transported from the aid stations by the

¹ Each Infantry division now has a medical regiment in lieu of the old sanitary train. See Tables of Organization, 81-W.—*Ed.*

litter bearer battalion or by ambulances as dictated by the military and topographical conditions. The director of field hospitals, under the orders of the sanitary train commander, is charged with the location and establishment of this important formation, which is the keystone of the divisional evacuating system, and which is conducted by the commanding officer of the field hospital assigned this duty, who with one of the medical officers of the hospital, three noncommissioned officers and six privates, and assisted by the consultants in psychiatry, orthopedics, and toxic gas, receives and sorts the cases, designating those for transfer to the division field hospitals, mobile hospital for nontransportable wounded, evacuation hospital, and those to be returned to duty.

In a command untried in battle it is well to have a sufficient number of military police assigned to assume charge of those returned to duty, to insure their reporting to their respective units.

A blanket, litter, hot-water bag, and splint exchange must be established under the charge of a noncommissioned officer whose duty is to see that for every one received one of each kind is returned to the aid station from which the sick or wounded man came, in this manner providing automatic replacement.

No attempt is made to provide medical or surgical care at this station beyond checking hemorrhage, readjusting a splint, or reenforcing a bandage, but antitetanic serum should be administered if previously omitted; the assistant of the triage officer with two privates makes the necessary additions or corrections to the diagnosis tags and prepares the field cards and envelopes of the cases examined by the triage officer and the consultants; one noncommissioned officer with two privates disposes of the cases as received in such a manner that they will not be confused with those already examined; the remaining noncommissioned officers with two privates superintends the evacuation of those examined and assigned to hospitals, and turns over those pronounced fit for duty to the military police, if doubt is entertained of their willingness to return to their units voluntarily.

Surgical cases are divided into the following classes: (a) Those able to perform duty in three days; (b) transportable requiring hospitalization longer than three days; (c) nontransportable.

The nontransportable cases are divided into four classes: (a) Sucking chest; (b) perforating abdominal; (c) severe hemorrhage; (d) shock.

Sucking chest and perforating abdominal cases not requiring immediate shock treatment are transported to the near-by mobile surgical hospital. Severe hemorrhage and shock cases are removed to wards assigned to such cases within the field hospital conducting the triage. Cranial injuries bear transportation well before operating and not at all afterwards, so these cases must be voluminously dressed, and, if not in shock, transported to an evacuation hospital designated for severely wounded, for the necessary surgical interference.

Medical cases are divided into two classes: (a) Those able to perform duty after hospitalization for three days; (b) those requiring hospitalization longer than three days.

The battle order designates the field hospitals for the care of sick and gassed cases and the evacuation hospitals to receive the severe and slightly wounded of the division as well as the location of the mobile surgical hospital sent forward for the reception of the nontransportable wounded. The corps ambulance companies, reinforced if necessary by the ambulance companies assigned to evacuation duty, evacuate all cases of the transportable classes to the hospitals designated by the triage officer, the transportables being divided into two classes, sitting and prone.

While partially equipped for surgical work no operative procedures beyond those necessary to save life will be attempted in a field hospital. The personnel of the field hospital assigned triage duty, as well as that of the field hospital in reserve, which may be advanced and become the triage, must be especially instructed in triage duty, for the work is exhausting under battle conditions and the triage party must be relieved from time to time.

THE DIRECTOR OF FIELD HOSPITALS

To each division is assigned a medical officer of the rank of major as director of field hospitals and who is under the immediate control of the sanitary train commander.* The duties of this officer are tactical and not administrative, and he maintains no office of record.

When the division is assigned a sector in the line he must make personal reconnaissance and study of the map, become familiar with the terrain, and submit recommendations to the division surgeon covering sites selected by him for the establishment of the field hospitals; he designates the field hospital for triage duty, the one for gassed cases, the one for sick, and the one to be in reserve; this designation and the location of each being incorporated in the division battle order in the sanitary paragraph.

He supervises the inspection of the personnel of the field hospitals and observes their performance of duty, making such recommendations to the division surgeon as he deems best to improve the service; he sees that each hospital is adequately supplied with medicines, dressings, foods, and heating facilities at all times.

During combat he takes station at the triage and supervises the evacuation, informing the division surgeon from time to time of the number of cases received and hospitalized in the divisional units and the necessity for an increase in evacuation.

Should the division be compelled to change location, and the triage and gas hospital contain nontransportable cases, he designates the number of personnel and the equipment to remain for their care, and reports the facts to the division surgeon.

On the march he accompanies the field hospital designated to care for the sick or wounded en route; he sees that the sick are disposed of as directed by the division surgeon and makes arrangements for the keeping of proper records pertaining to those left behind; he makes the necessary agreement for such reception in writing and transmits the document to the division surgeon.

THE FIELD HOSPITAL

(Numbered from 1 up)

The commanding officer of a field hospital is a medical officer with the rank of major and is under the direct orders of the director of field hospitals or the division surgeon.

The function of the field hospital is to provide food and temporary shelter, medical, and surgical care for the sick or injured divisional troops in combat or on the march, and in the absence of a camp hospital in the training area. A field hospital is a standard unit, designed with a view to mobility, and additional equipment will not be permitted.

The locations of field hospitals for combat service are defined in the battle order of the division, and care must be exercised to avoid crossroads, which are targets for enemy artillery, and the vicinity of ammunition dumps or aerodromes, or the vicinity of railheads, factories, or conspicuous buildings that are on ground recently vacated by the enemy.

Should the line stabilize, advantage should be taken of existing buildings which do not offer a target. All selected sites will be conspicuously marked with a large white cross upon the ground upon a dark background to preclude damage by indirect fire following aerial observation.

The roads leading to a field hospital must be plainly marked to direct ambulance drivers, and the signs are the property of the hospital, to be recovered when the hospital moves to a new location for further use. The designation of these hospitals for the care and treatment of certain cases is detailed under the article on triage, but no hospital except the triage should be opened for the reception of sick and wounded until its use is indicated, and then only in sections, unless it is definitely known from the nature of intended combat that all will be required.

Every effort must be made to maintain one hospital in reserve for use in an advance or retreat, and a hospital once established will not be closed except by order of the director.

A field hospital is divided into the following sections for administrative convenience: Reception and triage, surgical dressing, hospitalization, evacuation, record, mess, and

* In the medical regiment organization an officer of the rank of major commands the hospital battalion. See Tables of Organization 85-W.—Ed.

mortuary. Each hospital will be provided with facilities for combating shock, and as heat is the most effective agent for this purpose, small stoves will form part of the equipment.

Only those cases requiring hospitalization for not more than three days will be retained, and this class must be kept at the minimum to insure mobility. If the military situation demands a change in location, all cases will be, upon order of the director, transferred to an evacuation hospital without delay.

Being both an administrative and tactical unit, a field hospital maintains a full record system, employing the forms prescribed from time to time. The diagnosis tags, field medical cards, and envelopes of cases admitted are prepared for those not recorded in other units, alterations and corrections are made where required, and all completed cases are reported on sick and wounded cards. The record system includes loose-leaf files, a diary, and a card index of personnel.

THE DIRECTOR OF AMBULANCE COMPANIES

To each division is assigned a medical officer with the rank of major who performs the duties of director of ambulance companies under the direction of the commander of the sanitary train.*

He maintains no office of record, but transmits all communications arising in or referred to the ambulance companies; through constant inspection he insures the adequacy of personnel, equipment, and transportation, reporting deficiencies to the sanitary train commander; he concerns himself with the instruction of the companies, such instruction commencing upon the reporting of each company for duty with the division. This instruction must be given without regard to the length of service directed, since ambulance companies assigned to front-line work must be kept in a condition for immediate and effective service at all times; on the march he accompanies one of the companies and carries out the orders of the sanitary train commander concerning the distribution and service of the units under his command during the march; in the training area he maintains the ambulance service for the evacuation of the sick and wounded from their respective camps to the camp hospital or field hospital acting as such.

If time affords before the division enters combat, he, in company with the sanitary train commander and the director of field hospitals, will make a reconnaissance of the terrain and prepare a road sketch, in rough, showing the most suitable routes for ambulances and the locations of the ambulance companies, and submit it with his reasons for the approval of the division surgeon; his tentative recommendations having been approved, he furnishes a sketch to each ambulance company commander who in turn instructs the drivers in the location of all aid stations, triage, field, and corps mobile hospitals; during combat he alternates between the aid stations and field hospitals assisting in the evacuation from the combat line in every way to insure a steady, uninterrupted flow, and when a road block occurs he invokes the aid of the military police to give the ambulances from the aid stations the right of way; when an unusual number of casualties occurs at a point of the line he arranges with the commander of the litter bearer battalion for the rapid transport of so much of his battalion as is deemed necessary to the point, employing ambulances and trucks for the purpose. Should the number of casualties overwhelm the ambulance service he requests more transportation of the commander of the sanitary train and calls upon the commander of the supply train for the authority to use trucks returning empty from the front.

In boggy terrain or densely wooded areas with soft roads he is empowered by the division commander through the division surgeon to employ the regimental combat wagons which are admirably adapted for this service over short distances. He insures the automatic replacement of litters, blankets, splints, and hot-water baths to the aid stations, and employs such empty ambulances going to the front as are necessary to transport medical supplies; he makes immediate report to the commander of the sanitary train of unauthorized use or abuse of Medical Department transportation.

* In the medical regiment organization an officer of the rank of major commands the ambulance battalion. See Tables of Organization, 84-W.—*Ed.*

THE AMBULANCE COMPANY

(Numbered from 1 up)

Motorized ambulance companies are provided in the proportion of four to each division and assigned from the army ambulance service. Each company is commanded by an officer of the medical service corps, as the service is one of transport only, and the company commander is under the control of the director of ambulance companies. The light and heavy companies assigned a combat division will be in the proportion of three of the former to one of the latter.^w

The function of the ambulance company is the transportation of the sick and injured from the aid stations to the triage and field hospitals; to replace matériel removed from the aid stations with the sick and wounded, and transport needed medical supplies from the division supply unit to the aid stations; to transport sanitary personnel either to or from the front; and to provide ambulance service in camp, in the training area, and on the march.

The company commander is responsible for the discipline, instruction, efficiency of the personnel, and responsible for the property, transportation, and equipment of the unit. During combat he directs the work of his company in every part of the sector assigned through the director of ambulance companies by the division surgeon. He instructs his drivers by means of a road sketch or map in the location of the aid stations, the routes to be followed to the front and rear in conformity to the orders governing circulation issued by the administrative section of the division general staff, and the location of the triage and field hospitals. He establishes an ambulance relay station, as nearly as possible midway between the aid station of the sector served and the triage to provide for an ambulance returning from the front being replaced immediately; should his company become overwhelmed he advises the director and requests assistance; he maintains close liaison with the battalion and regimental surgeons and the commanding officers of the litter bearer companies.

An ambulance company, being an administrative and tactical unit, the records must conform to prescribed orders, and a loose-leaf file, a diary, and a card index of personnel and transportation will be kept, the latter containing all data necessary for the prompt furnishing of information required with reference to any vehicle. This data must include the details concerning number of individuals or wounded transported; the quantity of gasoline, oil, and grease used; the number of miles traveled; the details of the abuse of transportation; the damages sustained and the repairs or replacements indicated; and the spare parts required. This data is a basis for the report required by the director of the army ambulance service upon the completion of a service period.

THE DIVISIONAL LITTER BEARER BATTALION

To each combat Infantry division in war is assigned a litter bearer battalion which is under the control of the sanitary train commander, and companies of which or parts thereof will be applied by him to any part of the combat line to supplement the bearers of the regiments of separate battalions.^z

The normal duty of the four companies of this battalion is the littering of wounded from the front line to aid stations and from the latter to the point attained by the ambulances if conditions preclude the ambulances approaching the aid stations.

In this last situation it may be necessary to direct the bearer companies to establish dressing stations, the equipment for which remains at the camp of the battalion until needed. The establishment of these stations, however, in modern warfare will be infrequent, and then only while operating on a flat terrain. The battalion is commanded by a medical officer with the rank of major, the nature of the duty requiring experience in field work and disciplinary powers beyond the ordinary. He maintains no office of record, but presents a

^w Ambulance companies now form a part of the ambulance battalion of the medical regiment.—*Ed.*

^z In the medical regiment organization litter bearers are found in the collecting companies, of which three constitute the collecting battalion. (See Tables of Organization, 83-W.) In action these companies establish a collecting station and send forward litter bearer sections for the purpose of evacuating the aid stations on their front.—*Ed.*

numerical report of the cases carried upon the conclusion of combat. Close liaison with the regimental and battalion surgeons and the ambulance company commanders must be maintained.

The companies ordinarily proceed to the scene of activity by marching, and must be in a position of readiness at the front before the commencement of combat, since a sudden increase in casualties beyond the capacity of the battalion bearers in a particular sector of the line may demand their quick transport to that point. In such cases application is made to the director of ambulance to furnish the necessary transportation. Upon the conclusion of combat duties the entire battalion may be transported to the triage and field hospitals to assist the evacuation.

The equipment of the dressing station is simple and the work is confined to dressing wounds, readjusting splints, checking hemorrhages, administering liquid food, and heating the shocked, the evacuation to the triage being conducted with promptness. Should the establishment of the dressing station be decided upon after the commencement of combat, the battalion commander notifies the sanitary train commander of the location and time of opening. No records or reports are required from a dressing station. Use must be made of any shelter and if none exists application is made by the battalion or company commander to the nearest field hospital for a tent. In inactive periods the battalion camps with sanitary train headquarters and on the march follows the Infantry.

THE REGIMENTAL MEDICAL SERVICE

The regimental surgeon, as a member of the regimental staff, is the adviser of the regimental commander upon all sanitary subjects, and under his authority controls the Medical Department personnel attached to the regiment.

In his administrative capacity he inaugurates the instruction of the sanitary personnel and maintains sanitary discipline on the march, in camp and in combat. He is his own sanitary inspector and makes recommendations to the regimental commander for the installation and use of all measures indicated for the disposal of liquid and solid wastes, excreta, and manure. He has all sources of water supply investigated before permitting any to be placarded as potable, and sees that a sufficiency of water sterilizing bags are provided, and that the chlorination is efficiently performed.

The regimental surgeon cooperates with the police officer in the maintenance of thorough police of the entire environment of the command, and pays marked attention to the preparation, quality, sufficiency, and variety of food, and to the cleanliness of the kitchens and appliances and the exclusion of "carriers" from those handling food; he investigates the living quarters of the troops and determines the adequacy of floor and air space; he causes all members of the command to be inoculated against smallpox, typhoid, and the paratyphoids, and takes immediate steps for the isolation of every case of infectious and communicable disease and the segregation of contacts; he is responsible for the sufficiency of medical supply and maintains the combat equipment at its maximum at all times, forwarding requisitions as indicated from time to time; he is responsible for the inauguration and maintenance of the venereal prophylaxis stations, and personally sees that they are operated effectively, and that the stated physical inspections are made; in the training areas he gives lectures upon sanitary subjects in relation to field work to the officers of the regiment.

He maintains no office of record beyond a loose-leaf file, a diary, and a card index of the sanitary personnel, and prepares and forwards the prescribed reports; he institutes measures for the drying of clothing and shoes, the disinfection and bathing of the command, and with his assistant makes frequent examinations of the footwear of the entire command and the care of the feet, prescribing the correct sizes of shoes and socks, and has the ailments of the feet corrected; in cold or wet weather he must see that the feet are bathed daily in cold water and dusted with foot powder containing camphor if obtainable, and that the feet and lower legs are frequently given friction with tallow, salt-free lard, or whale oil; should the regiment be ordered to change location by marching, he informs the division surgeon of the time of departure and requests the necessary ambulance service for the command.

His tactical duties are concerned with terrain exercises and combat, and being furnished a map of the regimental area he selects the locations of the battalion aid stations and submits a report to the regimental commander for approval and incorporation in the battle order for the information of all, a copy being furnished the division surgeon. The map used must be of the same date and scale as those used by the regimental and battalion commanders.

If time affords he makes a reconnaissance of the terrain and instructs his subordinates, who will conduct the battalion-aid stations, as to the proper location and designates the routes of evacuation from the front to these stations, and the water points, and informs the division surgeon of his action. The regimental and battalion medical combat wagons, when not a part of the divisional train, are under his control. The division surgeon coordinates the regimental medical activities with other branches of the sanitary service of the division.

Combat may be suddenly entered upon before selection of aid stations can be made by the regimental surgeon and in this event each battalion surgeon locates his station and informs the regimental surgeon, by means of a runner, of the exact location and the roads to be used for evacuation, and this information is transmitted to the division surgeon and regimental commander.

In modern combat every available cellar, dugout, or cave affording protection from shell fire must be made use of, and if the terrain does not afford such shelter first aid must be rendered in the open and the evacuation to a sheltered location by litter made as quickly as possible. Wheeled litters should be used at every possible opportunity as their use obviates the exhaustion of the litter bearers and quickens the evacuation. When facilities offer for the establishment of an aid station under proper conditions, every wounded man must receive a prophylactic dose of antitetanic serum before he is evacuated.

Facilities will be provided for combating shock and splinting fractures in aid stations. Shock cases must be heated and surrounded with hot-water bags and blankets, and all compound fracture cases must be correctly and securely splinted, both classes being given an opiate before they are evacuated. All fracture cases should be splinted as near the scene of injury as possible, and the trench or snowshoe combination splint and litter is especially indicated for all fractures of the lower extremity.

Cases of toxic gas will not be treated in a dugout, cave or room with the sick or wounded, since the latter may be gassed, and the equipment so penetrated that others will be gassed from it.

All gassed cases must be evacuated in ambulances carrying only that class of cases. Should the command occupy trenches, the sanitation must of necessity be as perfect as human ingenuity can devise. This subject has been considered under the article on sanitation. Upon relief from a trench sector the surgeon of the command to be relieved must conduct his successor over the entire area giving him full information on all points necessary for conduct of an efficient sanitary service.

DIVISIONAL MEDICAL SUPPLY UNIT

The divisional medical supply unit is an integral part of the sanitary train.^v This unit is the medium for the procurement and distribution of all Medical Department supplies and equipment required for the sanitary service of the division. The function, personnel, organization, and equipment of this unit are fully covered upon graphic charts and in text under the separate heading "Supply Service." Attention, in this connection, is invited to the table of organization, "Sanitary train—Infantry division." For march and road control this organization is under the control of the commander of the sanitary train. In all other respects the commanding officer of this unit is an assistant to the division surgeon, and as the divisional medical supply officer advises him upon all questions relating to medical matériel.

^v The medical supply section is now part of the service company of the medical regiment. See Tables of Organization, 82-W.—Ed.

DIVISIONAL LABORATORY UNIT

To each division, whether combat or replacement, is assigned a mobile laboratory, the equipment of which is packed in chests and transported upon one truck, the unit being part of the sanitary train.*

In the training area the unit is located at the point of greatest use, and when the division enters combat, at the camp of the sanitary train in conjunction with the medical supply unit.

The equipment is sufficient for the routine bacteriological work of the front hospitals and the testing of the sufficiency of chlorination in the water for drinking purposes. The greatest use of the unit is in the training area, where time affords for the bacteriological work; but during combat its use is of necessity curtailed, as the field hospitals do not retain cases sufficiently long to warrant bacteriological technic, though upon occasion it may be called upon to exercise bacterial control of cases in the mobile surgical hospitals, or to make pathologic examinations and prepare specimens of interest for transportation to the central laboratory.

VII

THE REGULATING STATION

MEDICAL DEPARTMENT ACTIVITIES

Regulating stations for the military control of railway traffic are established in large railroad centers within the zone of the armies. The number and distribution of those groups will depend upon the size of the forces and upon the topographical distribution of the transportation lines.

Each regulating station group will be under the command of a regulating officer who will be a member of the general staff corps, and the coordination section thereof. Regulating stations will ordinarily serve an army or group of armies but may be established for the service of a detached army corps. The regulating officer will require a capable administrative and technical staff to assist him in the many responsible duties associated with his position of a military general manager of a railway center.

Regulating stations and regulating officers are under the direct control of general headquarters through the agency of the chief regulating officer, who is a member of the coordination section of the general staff at general headquarters. Regulating officers remain at all times in close liaison with this control, this section of the general staff being responsible for troop and train movements and supply within the theater of operations. General headquarters will keep regulating officers constantly advised upon actual or anticipated changes in the military situation with reference to their front. Regulating officers will therefore be in a position to decide all questions involving train movements upon their immediate sector.

All trains coming from the zone of supply are controlled by the troop movement bureaus, which are under the control of the coordination sections of the general staff at the headquarters concerned. This control continues until trains enter the zone of the armies, when they come under the direction of regulating officers. Conversely, all trains leaving the zone over which the regulating officers exercise control are taken over by the troop movement bureau of the coordination section concerned.

This system, wherein regulating officers and troop movement bureaus have been endowed with powers beyond those delegated to the general managers of civil railway systems, makes for efficiency, but requires the services of experts in railway technique, excellent liaison and coordination, and the most perfect telephone and telegraph facilities obtainable.

The regulating officer is the commanding officer of the regulating station group. He is in every sense a post commander. A medical officer therefore of experience and ability in administrative and sanitary affairs must be detailed as an assistant to regulating officers. This medical officer will bear the same relation to the commanding officer of the station group as does a post surgeon to the commanding officer of a garrison, and as a member of the staff of the regulating officer will be his adviser upon all questions relating to the conduct of the sanitary service within the domain of the regulating station group.

* The medical laboratory section is now part of the service company of the medical regiment. See Tables of Organization, 82-W.—Ed.

Such additional officers of the medical department as may be required will be assigned to regulating stations. Inasmuch as those groups are large and entail the handling of large numbers of men, it will usually be necessary to station at such places a camp hospital. This unit will, however, remain under the orders of the chief surgeon, army service area.

Should the actual management of hospital train dispatching require additional commissioned assistants, these may be detailed from among officers of the Medical Corps. These officers will be concerned with the multitudinous duties attendant upon the dispatching, supply, inspection, etc., of Medical Department trains.

The senior medical officer present, who as stated will be known as the surgeon, is responsible for the sanitation of the area occupied by the station group. In this respect only he is responsible to the chief surgeon, army service areas. Medical and dental attendants will be furnished the command by the personnel of the camp hospital, where permanent hospitalization will be provided for the sick of the group.

The medical officer on the staff of the regulating officer not only controls the movements of the hospital trains in the domain of the regulating station, but is responsible for the conduct and efficiency of the personnel, and for the equipment and supplies carried by the trains.

Commanding officers of hospital trains assigned to regulating stations will be under orders of the surgeon of the regulating station group in matters pertaining to Medical Department administration. This staff officer is responsible to the regulating officer that trains are at all times ready to answer calls and kept properly stocked and provisioned.

He maintains a small storehouse for the medical supplies required by hospital trains. This issue point will be under an officer who is thoroughly conversant with the requirements of these units in medical supplies and equipment. The necessary rations for trains will be drawn from the common source of such supplies.

Tables of organization of personnel will be kept on record for each train in service. Should the chief surgeon, expeditionary forces, order changes in personnel of trains, the regulating officer will see that such directions are carried out, and the personnel will be regulated through the regulating station office. All changes in personnel of trains will be kept on record at the regulating station concerned.

The number and composition of hospital trains, assigned to regulating officers by the coordination section, general staff, general headquarters, will be kept on a classified list, copies of which will be furnished the chief surgeon of the army, and the chief surgeon of the forces.

This list, giving carrying capacity (in litter and sitting) of each train, is particularly important in case foreign or other than regular hospital trains are placed at the disposal of the regulating officer, since such trains will vary greatly in capacity. The list will be valuable for the use of officers in charge of evacuations in preparing loads when trains are announced. Changes in lists will be reported at once and all retained copies modified in consonance therewith.

The surgeon of a regulating station group maintains an accurate record of all hospital trains in all particulars, together with lists of modifications of schedules for trains going to any part of the zone, and a list of evacuating points supplemented with maps giving the length of sidings and loading facilities in the entire zone, and the number of trains permitted to load at each siding during a period of 24 hours, and the length of stay allowed upon each siding; he informs the chief surgeon, army group, army corps, or division, as the case may be, of this data when it is desired to establish an evacuation hospital or loading point at any siding; he receives a report from each train commander of the number of cases carried, by classes, and keeps a correct record based upon these reports which he reconciles with daily phone or wire reports from the evacuating officers. (For the procedure to be followed in the use of hospital trains at the front, see text of evacuation hospital.)

Hospital trains are Medical Department organizations and, as sanitary formations, are under the direction of the chief surgeon, expeditionary forces. As railway units, and in systems of evacuation within the zone of the armies, they are operated under the direction of the regulating officer to whom they are assigned. They are repaired by the transportation service.

Assignments of hospital trains will be made by the coordinating section, general staff, general headquarters, to regulating officers, and to the troop movement bureau at headquarters, S. O. S. When the coordination section, general staff, directs a change in assignment of a hospital train by telegram or otherwise from one regulating officer to another, the former regulating officer notifies the following by telegram as soon as the train is ordered to move: The commanding officer of train; troop movement bureau of area to which train moves; regulating officer to whom train is assigned; coordination section, general staff, general headquarters; chief surgeon, expeditionary forces.

Through the surgeon of the group there must be a constant liaison between the regulating officer and the train commanders. The regulating officer being informed as to the general and special situation at the front, is usually in a position to say when the next journey by any particular train will be made. When trains are in one garage, journeys will be assigned consecutively and the first train in will be the first train out. All trains, however, must be fully stocked and prepared at all times and held in a state of readiness for calls upon short notice.

For the purpose for simplifying evacuation, hospitalization facilities will be districted into zones. This is accomplished by the coordination section, general staff, in consultation with the chief surgeon of the forces. Regulating officers will be advised of the zone into which the chief surgeon will make his evacuations. After this division into zones becomes effective, the commanding officers of hospital centers and base hospitals will telegraph daily to their respective regulating officer the number of beds available for use of the army which the regulating officer is serving. These messages will be sent direct and will state the beds available as of 8 p. m. and that this number will be available for 24 hours. In these figures, trains routed to the hospital in question, but not yet arrived, must have been considered. For centers in base sections these telegrams will be relayed by the office of the chief surgeon. In these reports beds will be classified as surgical, medical, contagious, and convalescent. The arrival of a train at a center or detached hospital is announced by telegram from the regulating officer, and the commanding officer of the train.

After all trains have been dispatched, regulating officers will daily inform the coordinating section, general headquarters, and the office of the chief surgeon of the forces of the number of hospital beds available. The evacuation officer, army chief surgeon's office, and representing the coordination section of the army general staff, or the commanding officer of each evacuation hospital group will advise the regulating officer of his area or army as of 8 a. m. and 6 p. m., each day as to the number of evacuable cases classified as follows: Wounded preoperative, litter and sitting; wounded, post-operative, litter and sitting; medical cases, litter and sitting; gassed cases, litter and sitting; officers, allies, and prisoners, litter and sitting; contagious, litter and sitting.

The regulating officer with this data available will arrange for a sufficient number of hospital trains to evacuate completely the evacuable cases reported; he will determine the destination of each train according to the cases to be evacuated; i. e., medical cases to medical hospitals, and surgical cases to surgical hospitals, etc. The evacuation officers do not request trains; they merely give the regulating officer the number of evacuable cases.

As soon as destination and schedule for trains are arranged with the railway technician, the regulating officer will telephone to the evacuation officer concerned giving the exact load of each train, the number and type of cases, and the time of arrival and departure of train at loading point, and will direct the number of rations to be placed on the trains when rations are necessary; in case other evacuations by same train are to be made further along the route, each evacuation point or collecting station will be notified in the same manner.

The regulating officer will confirm telephone calls to the evacuation officer by telegram, and in addition will send copies to the following: Coordinating section, hospital evacuation, army; commanding officer of base hospital at destination; regulating officers through whose areas train moves; troop movement bureau of area in which train moves; statistical department, adjutant general's office, general headquarters; chief surgeon, expeditionary forces. In each telegram to the evacuation officer he is instructed to give copy of telegram to the commanding officer of train.

The evacuation hospital will see that necessary steps are taken to load the train in the allotted time, and only with the number and type of cases designated by the regulating officer. If the loading of the train is delayed the train will lose its schedule and will be subjected to delays en route. Should the train be loaded with other than class of patients designated, the base hospitals at destination may not be equipped to take care of them.

In time of calm, collecting of patients from two or more evacuation groups is possible, but the total loading time from different evacuation centers should not exceed four hours, including the time spent en route from one loading point to another. In intensive operations full train loads only are sent from each evacuation group. Before loading a hospital train evacuees must be most carefully classified into seriously and slightly wounded, and ordinary and special sick. Such classification will permit of loading the patients by classes into different parts of train and will greatly facilitate their ultimate distribution at unloading points. Further grouping according to destination will be resorted to whenever possible. The evacuation officer will give the commanding officer of train the evacuation sheet, on which appears nominal lists of all cases (classified) to be evacuated; the commanding officer of the train in turn will prepare his train for this load.

Schedules given to hospital trains will depend upon the zone in which they may be operating. Within the zone of the armies military schedules only will be obtainable and these are usually slow. While traversing the zone of supply schedules will be faster. In cases of emergency trains may be dispatched on fast schedules for entire length of journey, provided it does not interfere with the schedules of military trains which have priority. All fast intercommunicating schedules will be arranged by the coordination section, general staff. Such arrangements are immediately made known to the regulating officer interested, to permit train dispatching and the notification of proper railway authorities.

As armies advance or retreat the regulating officer will select new loading stations at points most conveniently located to the proposed evacuation centers decided upon by the army chief surgeon. Army chief surgeon will consult regulating officer on the location of these evacuation points for loading hospital trains. Reconnaissance of loading points will be made by the regulating officer, in conjunction with the evacuating officer of the army and the railway technician, should an important movement of the army be contemplated.

Regulating officers must arrange with the railway technician to route hospital trains so as to allow patients to reach their destination in shortest possible time. Long stops at stations will be permitted only where there are tracks which will permit loading or unloading without blocking main tracks. In small stations where there are no such conveniences, the unloading must be done in the short time allowed and such unloading points will be avoided whenever possible. On branch lines a night service is not always organized, and advance notice will be given should train be due to arrive during the night. Trains will not be split except in certain large stations and then only when absolutely necessary.

MEDICAL DEPARTMENT HOSPITAL TRAINS

For the railway evacuation service of an expeditionary force hospital trains will be provided. Each train will be capable of transporting 360 prone patients. The number of trains required will depend upon the size of force, length of land lines of communications, and the nature of the combat problem. In general terms it may be stated that with forces of 20 combat divisions (one army) or less, two Medical Department hospital trains will be required per division and with forces greater than one army (two or more armies) one train per division will suffice.

Hospital trains must be constructed in time of peace in conformity to standard specifications and garaged at convenient locations under the charge of caretakers, for when war is declared the rolling stock of railways is too much in demand to permit the assignment of a sufficient number of Pullman, tourist sleepers, or first-class passenger cars to the Medical Department, and the alterations for the conversion of American cars of any type is time consuming and expensive. Should it become necessary to convert coaches to hospital train use the cardinal defect to be overcome in American cars is the absence of side doors on both sides of every car to be used for ward purposes, as without side doors for loading it will be next to impossible to introduce a loaded litter without intervals between the cars to permit a litter being passed into the vestibule.

As locomotives are not always available in war for permanent attachment to a hospital train to furnish steam for heating, a steam boiler of adequate capacity will be installed in the brake van or baggage car to supply steam at all times, and a gas motor-driven dynamo to supply the electric lighting power, both plants being under the charge of two mechanics, one relieving the other at stated periods. When the train is under traction the locomotive will supply steam for the radiators, and the dynamos attached to the running gear of each car the electric current, the excess going to accumulators; but as hospital trains often stand idle for long periods it is in the interest of economy and utility to maintain separate heating and lighting units, especially in cold weather when if in motion the locomotive requires its steam for traction use with these heavy trains.

A field officer of the Medical Corps will be assigned to each hospital train as commanding officer. He will be assisted by medical officers, nurses, and enlisted men as indicated below. The duties of a hospital train commander may be conveniently classified as administrative, and professional or technical.

As an administrative officer he controls his personnel and patients, being responsible for their discipline, rationing, and comfort at all times. He is responsible that none are evacuated except those appearing upon lists furnished him prior to the movement. The question of triage, which is of the utmost importance in an evacuation system, is carefully considered by the commanding officers of all trains, cases which should properly have remained in the zone of the armies being reported by name and organization to the regulating officer.

Cases of death occurring en route will be reported with full particulars to the regulating officer, who will transmit this information to the proper office. The commanding officer of trains has authority to refuse cases which he deems unfit to travel. He will report his action on such instances to the regulating officer. He maintains an office of records for the sick and wounded under his care and for his detachment of Medical Department enlisted and members of the Army Nurse Corps (female).

When the commanding officer of the train had carefully checked the data given him upon an evacuation and verified same with patients on board the train, he will send a telegram to the following:

The chief surgeon of the forces (or his deputy at headquarters, Services of Supply).

The commanding officer of the hospital center or hospital at destination.

The regulating officer concerned.

This telegram will contain data covering the following, classified further into officers, nurses, allies, and enemy prisoners:

Total load, litter and sitting.

Wounded, litter and sitting.

Sick, litter and sitting.

Gassed, litter and sitting.

All cases for evacuation will be carefully inspected by the evacuation officer prior to loading upon train. No patient will be evacuated unless properly clothed. All cases requiring antitetanic serum must have received the proper injections. Equipment carried will be limited to the personal belongings of the patient, all arms, accoutrements, etc., having been turned in for salvage at the hospital.

Before loading the commanding officer of the train and evacuation officer will verify the number to be evacuated. When loading is completed the commanding officer of train advises the railway transportation officer who furnishes him with an order of transport showing destination, stops, and load; the commanding officer advises him of his readiness to leave and dispatches the several telegrams previously mentioned. It is important that the arrival of the train at the destination be announced in advance, in order that the receiving officer of the hospital or hospital center may arrange for the prompt and efficient transportation of the patients to the various hospitals.

Trains may be stopped en route at hospitalization points to unload patients when the commanding officer considers them unfit to complete the journey. To arrange for such stops and to assure quick action and preparation, the commanding officer will telegraph ahead to the railway authorities and the regulating officer concerned, as well as to the commanding officer

of the hospital to receive the patients; the commanding officer of the train will report such cases to the regulating officer and will request a receipt for all patients removed from his train at other than designated points.

Accidents or derailments should be reported immediately, by telegram, to the regulating officer, and should be confirmed by letter giving full particulars. The regulating officer will do everything in his power to expedite the sending of relief and wrecking crews to the place where an accident has occurred.

Unauthorized individuals will not be transported upon hospital trains. Authority to travel upon a hospital train, for other than train crew, personnel, and patients being evacuated, will be obtained in writing from the office of the chief surgeon of the forces.

Frequent inspection of trains will be made by the surgeons of the regulating station groups, who will note carefully the conduct of the command and personnel, reporting any unfavorable conditions to the chief surgeon of the forces, recommending changes in personnel when they are for the best interest of the service.

Requests for leave of absence or furlough will be forwarded through the proper channels to the regulating officer by commanding officers of trains. Such absences will be granted only when not interfering with the efficiency of train service, and not at all during periods when extensive combat operations are contemplated or in progress.

The hospital train consists of 16 specially constructed communicating cars, in assembly about 960 feet in length. The exteriors of the cars are the color of Army khaki, with the Red Cross of the Medical Department imposed upon the sides, roof, and at each end of the cars. The upper structure is almost entirely of wood, the lower structure consisting of a steel-beam frame riding upon two sets of double trucks. There are 9 regular ward coaches, 1 coach for contagious and infectious diseases, another for the staff officers and the nursing personnel, 2 coaches for kitchens, 1 coach devoted to a pharmacy and an emergency operating room, another for the sleeping quarters of the personnel, while the last coach is utilized for stores and provisions.

Each ward coach, with the exception of the infectious and contagious car, contains 36 superimposed bunks, arranged in tiers of 3; 18 placed on either side, permitting a generous central passage. These bunks are attached to the walls of the car by collapsible bunk standards, making it possible to remove individual bunks for the purpose of cleaning and disinfection or for transporting cases from car to car without transferring patients to litters. It is possible, by allowing the middle bunk of the tier to drop upon its standard and thereby forming a back, to produce a seat formed from the lower bunk. By this arrangement it is possible to transport 48 sitting and still utilize the 12 upper bunks for lying cases, thus making the total capacity of the car 60 patients, should suitable cases be available. With the proper combination of lying and sitting cases 600 may be carried, 480 sitting and 120 lying, or 718 sitting.

The infectious and contagious ward car contains 24 bunks. This car is divided into four distinct compartments, thereby permitting the transportation of four different infectious or contagious diseases. In case of these individual compartments there are six bunks.

At the lower end of each ward car is a small lavatory. Here are also cupboards for the eating utensils, racks for drinking and sputum cups, tanks for drinking water, etc. Opposite the lavatory is a small compartment containing the racks for bedpans and urinals, cupboards for cleansing materials and disinfectants for use in that particular ward car. The toilet for the car is also placed in this compartment, consisting of a galvanized-iron latrine bucket with ordinary toilet seat.

Ward cars are well lighted by spacious windows. Artificial light, furnished by electric current, generated by individual dynamos attached to each coach and stored in individual accumulators, two sets of the latter in each car. The power for the dynamo is received by bolt transmission from a pulley on the axle of one of the trucks, while the train is in motion.

Ventilation is brought about by upper ventilating windows in some trains and by special roof ventilators in others. In addition to this means, three large electric fans are placed, one at either end of the car, and one in the center. These are kept constantly in motion when the train is loaded, this combined system effectively maintaining circulation of fresh air. In addition to the larger fans referred to, small portable fans, five to each coach, are available,

which can be readily placed upon receptive standards, attached to the car wall opposite individual bunks carrying serious respiratory cases, for the purpose of affording them more and better air. The heating of ward coaches is effected by means of cylindrical iron steam radiators, placed one under each lower bunk, and two upright in the central portion of the car, steam being obtained from the engine.

The pharmacy and emergency operating car is placed in the center of the train assembly. The numerous cupboards on the walls of this car contain the necessary drugs, dressings, and appliances for use in emergency. Water and the ordinary field surgical instruments and instrument sterilizers are carried. A complete and compact train office is situated in the lower end of this car.

The forward kitchen car is divided into compartments; one of these is utilized as the officers' pantry; another for sleeping quarters for the cooks of the train, still another for patient officers' lounging and mess room, while the main and central portion of the car is devoted to a well-equipped kitchen. The rear kitchen car is also divided into compartments, one for a personnel mess, another for noncommissioned officers' sleeping quarters, pantry, and kitchen. The quarters of the personnel are similar in arrangement to that of one of the ward cars.

The stores and provisions car is divided into five compartments; the lower one being fitted up for use as a refrigerator, in which can be placed about five quarters of beef, plenty of space remaining for other perishable articles. Another compartment is utilized for the storing of canned rations; another for the transportation of officers' baggage, and workroom for the mechanics of the train; while still another is for storing extra blankets, linen, repair parts, etc.

Each train carries approximately 2,000 rations aboard at all times. The water supply is obtained from reservoirs placed in the structure of the roof of each car. The reservoirs of the kitchen cars contain about 800 gallons of water apiece; while those of the ward cars carry about 150 gallons. Hospital trains, although carrying a stock of 2,000 rations, when garaged at distant points may require replenishment of this stock by the transfer of rations overland upon motor transportation. Rations may be drawn at any time from railhead officers who are under the regulating officer should shortages occur when the train can not replenish from its own depot.

The staff car is divided as follows: One compartment fitted up for combined sitting room and dining room for the staff officers; three compartments for use as sleeping quarters for the officers of the personnel; two compartments as sleeping quarters for the nurses and one for the dining room of the nurses.

The personnel of each hospital train consists of three medical officers, three nurses, three noncommissioned officers, of which two are sergeants and one a sergeant first class, two cooks, one mechanic, twenty ward orderlies, privates or privates first class, and ten men for general duties. The senior medical officer present is the train commander. One assistant is designated as summary court officer, and performs, in addition, any other duties that may arise. The second assistant acts as supply and mess officer. The senior noncommissioned officer carries on the work pertaining to records, reports, returns, and other office work of the organization. Another sergeant is detailed as general duty sergeant, and the third is the mess and supply sergeant.

After the trains have been unloaded at a hospital center or base port, the mattresses, bedding, etc., must be subjected to disinfection to free the articles of vermin as well as contagion, and the interior of every car must be gone over with a 5 per cent solution of lysol, after which the doors and windows are kept open for at least six hours.

The general plan followed after a train has been loaded, to ascertain the type of treatment, diet, and orders for patients being transported is as follows: One officer, accompanied by a nurse, commences an examination of the cases in the lower half of the train, while another officer and nurse take up the same work in the upper half. The field medical card of each case is examined by the attending officer, and a general survey of the case is made. He then determines any treatment necessary for the case en route, in the way of medical prescriptions, changing of dressings, surgical appliances, special diets, etc., while the nurse accompanying him makes notation in the train order book of the bunk number, name of

patient, and treatment prescribed. When this has been accomplished throughout the train, this data is compiled, and the professional work is apportioned among the officers and nurses for completion.

Ward attendants in each ward coach will prepare a complete list of their cases. This list will be prepared after the medical officer has made his rounds. The consolidation of these lists will be the basis of the train commander's report to the regulating officer and the chief surgeon with reference to the trip, and will become a part of the final records of the train. Upon the completion of an evacuating trip, the commanding officer of the train will prepare a brief report for submission to the regulating officer under whose command he is assigned. This report will cover the gross details of the evacuation and any incidents occurring during the period thereof.

A supply of such Medical Department blank forms as are required by trains will be kept on board each train at all times. These will be replenished from stock at replenishment depots.

A list of standard equipment and composition of each train will be kept in the office of the surgeon at regulating stations for reference. Should coaches be removed from or added to a train, the regulating officer will be notified of the time, place, and cause of the change, in order that he may properly alter his retained data relative to the carrying capacity of the train.

Changes in the composition of hospital trains are authorized only by the chief surgeon of the forces; when a regulating officer finds that conditions require such changes, he will consult the chief surgeon's office; when cars are detached through emergency or accident, the regulating officer will endeavor, through the proper channels, to have them returned.

Mental cases requiring special care will be put in separate compartments; if a guard is necessary, attendants from the evacuation hospital will be detailed for the voyage in such numbers as are deemed necessary. Contagious cases will be transported in the special car provided for them, and when unloaded must be so designated; it is imperative that cars carrying contagious cases be thoroughly disinfected as directed in orders issued by the chief surgeon of the forces.

At each regulating station and embarkation point there will be established depots known as hospital train replenishment depots, which carry on the following functions in reference to hospital trains: Administration and regulation within sections of the services of supply, under direction of the transportation division of the chief surgeon's office; the replenishment of supplies for hospital trains; the replacement of personnel; general and sanitary inspection; arrangements for minor repairs; central mail office for hospital trains; and the furnishing of motor transportation for use in connection with the hospital train service.

Prompt delivery of mail to mobile organizations of this type will always present a difficult problem. Every effort must be made, however, to accomplish this result. Mail should be forwarded to the chief surgeon of the section in which a train operates or to the regulating officer in command of the regulating station to which the train is assigned.

Personnel, food, fuel, mail, and accessories intended for hospital trains will be sent to the main depots located at the regulating station. Telephone communication between these depots and headquarters of the regulating stations must be established. These depots will be kept stocked with special diets and such other medical supplies conducive to the comfort of the patients as may be available in regular depots or those of the auxiliary aid societies. Branches of the hospital train replenishment depot may be required upon long stretches at some convenient junction where trains stop en route.

In loading and unloading patients, prone cases will not be moved from one litter to another except when absolutely necessary. At all hospitals and centers an adequate stock of litters, blankets, etc., will be maintained so that the prompt exchange of these articles can be effected without disturbing patients. Supply officers of hospitals will receipt to the commanding officer of hospital trains for all such nonexpendable matériel for which an exchange could not be accomplished.

Train commanders will personally arrange the exchange of linen, blankets, etc., with the supply officers of hospital centers or hospitals to which the evacuation is made. It will frequently be necessary for train commanders to replenish the stock of rations of their trains

during the stop at unloading points, and this will be accomplished by making requisition upon the hospital center or unit quartermaster.

The meals of patients are served by transporting the food from the kitchens in heat-retaining utensils to the several ward cars, from whence it is distributed by the wardmaster. Hospital trains will have the same hospital fund privileges that may be authorized for other Medical Department organizations, and every effort must be made to furnish patients being transported a varied diet of light nourishing hot food. In practice it will be found better, as a rule, to avoid the heavier items of the ration in meals served patients upon trains where opportunities for exercise of even those able to move about are so limited. Use of the sales commissary will be taken advantage of at every opportunity. When trains have no kitchen-car facilities, arrangements for feeding patients and personnel en route must be made. These stops and messing arrangements must be provided for in the schedule for the journey. Kitchen cars will be requested in the assembly of the train whenever it is known that they are procurable. Even if the coaches are not intercommunicating, the inclusion of kitchen cars will make the train independent as regards messing, since meals may be prepared en route and served to cars during stops.

There will be maintained at the embarkation depots a unit known as the casual hospital train unit, from which replacements are furnished to meet the deficiencies in the hospital-train personnel, arising through transference of personnel to other organizations as the result of sickness, misconduct, etc. A certain percentage of this personnel is placed upon hospital trains for tours of instruction in that particular service, so that when replacements are made, experienced men can be utilized to fill the vacancies.

A hospital train repair service must be maintained for making minor repairs to the trains. At the time of inspection the general condition of the train is noted, and if breakages have occurred during the voyage, the train is ordered to garage at a designated place, where broken parts are repaired or replaced by the transportation repair service.

The movements of hospital trains in the Services of Supply are arranged for by the transportation section, chief surgeon's office, with the troop movement bureau, the latter relinquishing the trains to the regulating officers upon entrance into the Army service zone.

From a regulating standpoint, the commanding officer of the hospital train is in command of the evacuation as far as relations with the transportation service are concerned, and acts as a troop commander of the evacuees, as defined in the rules governing ordinary transportation. He receives his instructions from the regulating officer as to destination of his train, and, based thereon, he makes out his orders of transport as directed by the regulating officer, who will be consulted upon all movements of trains not previously authorized. Upon completion of the evacuation, train commanders are authorized to order their trains back to the regulating station group.

VIII

HOSPITAL CENTER HEADQUARTERS, EXPEDITIONARY FORCES

(20,000 beds)

A hospital center of 15,000 beds or more should be commanded by a brigadier general of the Medical Corps, and the officer selected for this important duty must be active in mind and body, as the duties are onerous and require high administrative and professional attainments, for he should direct all policies and activities of the center peculiar to location and not covered by precedent or current regulations and orders.

When the hospital center is organized the commanding officer should not be expected to supervise personally routine matters, but as far as possible he should be left free to observe daily the operations of the various organizations, in their professional and administrative activities, with a view to correcting defects or to originate new policies that such observation suggests for the improvement of the service. He should have as assistant one who is qualified to assume his duties and who enjoys his complete confidence.

His office is divided into two main groups, technical and administrative. The technical group is composed in the main of consultants, each having general supervision over the clinical activities in the entire center in the particular service represented, and holding weekly conferences with the chiefs of the service he represents. In this manner the services are kept informed of recognized efficient methods of treatment in other organizations.

At the conclusion of a conference each center consultant should make report and recommendations to the commanding officer relative to personnel and methods of treatment employed in any unit of the center within his sphere in which improvement is indicated. Center consultant should visit such special cases from time to time as requested by the chiefs of services.

Each consultant should render a monthly report to the center commander upon all commissioned personnel engaged in clinical work under their supervision, with recommendations which are pertinent for more efficient and harmonious service in the various hospitals comprising the center. The main divisions of the technical group are: Surgery, Roentgenology, and medicine. These sections are either apportioned among the component hospitals of the center, or certain hospitals are designated for the care and treatment of certain classes of cases as military operations demand.

Surgery.—This grand division is subdivided into sections as follows: Maxillofacial; eye, ear, nose, and throat; neurological; orthopedic; general.

Roentgenology.—This division is supervised by an officer of the consultant body who should be thoroughly familiar with the technic of his service and should also be qualified to direct the necessary repairs in a defective machine.

Medicine.—This grand division is subdivided as follows: General medicine; neuro-psychiatry; ophthalmology; tuberculosis; toxic gas.

Like those of the surgical division, these sections are either apportioned among the component hospitals of the center, or certain hospitals are designated for the care and treatment of certain classes of cases as the military operations demand.

In addition to the foregoing, divisions of the technical group are:

Dental.—The officer in charge of this division acts in a supervisory capacity over the dental surgeons of the center, and this duty, not being an engrossing one, he maintains an office for the professional treatment of members of the headquarters personnel.

Nursing.—This division is under the chief nurse of the center, and she has general supervision, under the center commander, of all policies and instructions relating to the nursing service, that uniform application may be made to all component hospitals. She should hold frequent conferences with the chief nurses of component units, for the purpose of advising them of current instructions and for originating new policies for the approval of the commanding officer toward improving the nursing service. She examines all reports and returns relating to the nursing service and prepares them for the action of the commanding officer.

Graves registration service.—One officer of this service is assigned prior to the opening of the center, and he is concerned with the selection and lease of a cemetery site, subject to the approval of the commanding officer, and with the correct registration of all interred therein, particular attention being given to the names, organizations, and grave numbers.

The administrative group, whose activities are coordinated through the adjutant, is composed of the following divisions:

Adjutant.—This important division should be in charge of a member of the medical administrative service whose previous experience qualifies him to handle the routine correspondence and maintain the record files of a large organization. His duties are similar to those provided for in regulations, but being of an entirely administrative character, if he is a member of the Medical Corps he should be relieved of all professional service as contemplated in the Manual for the Medical Department, United States Army, 1916. He should institute means for correlating the activities of officers attached to the center headquarters in an administrative capacity, and should publish to the center such orders or instructions received from higher authority and provide for the execution of policies decided upon by the commanding officer peculiar to location. He should act as summary court officer for the hospital center headquarters only, each base hospital maintaining its own summary court.

Records.—Under supervision of the adjutant, this division is responsible for the correct filing and care of all official correspondence under prescribed methods originating in or received by any office of the command requiring reference or records; he prepares all official correspondence emanating from the center headquarters; is responsible for proper acknowledgment of all mail received or dispatched, keeping accurate record of the same. He

should assume responsibility for telegram numbers and their proper sequence, maintaining a telegraph file; preserve all records of public property chargeable to center headquarters. This division has three sections—postal, mailing, and distribution.

Postal.—Conducts center post office, which should be in charge of a noncommissioned officer having general supervision of all mail orderlies of separate units and responsible for their receiving and properly distributing all mail of the center. Improperly addressed mail will be corrected by reference to index of patients kept in evacuation office. Receipts for registered mail will be taken from all individuals concerned.

Mailing.—This section prepares both official and private mail for shipment, noting compliance or lack of it with existing censor regulations.

Distributing office.—This office will be responsible for the prompt and accurate distribution of all instructions, orders or official communications relating to the command under methods prescribed by center headquarters. An index should be kept of all instructions or orders issued from headquarters and should provide that all orders, memoranda, etc., requiring numbers are used in proper sequence. Numbers should be issued and charged to the various departments requiring them. This office indexes orders for use at headquarters, and all blank forms for use of the center should be requisitioned by and distributed from this office.

Statistics.—In so far as is pertinent, the duties and responsibilities of this office should conform to those indicated for personnel office (q. v.) relating entirely to patients in the center. Index of all deaths occurring in the center will be compiled and correctly kept from records available in the center, cause of death being shown under separate classification.

Personnel.—This division is charged with the instruction of subordinate officers in separate units for correct and punctual rendering of all reports relating to personnel of command required by regulations or current orders; the keeping of the records of all organizations, showing strength present and authorized; the issuing of orders pursuant to competent authority for the change of status of all organizations or individuals of the command, making the same when applicable a part of the personnel record of personnel as is hereafter provided, and providing for the notification to proper offices of such changes; the keeping of separate card files of all personnel, classified as officers, Army Nurse Corps, enlisted men and civilian employees, showing those present or absent or transferred, who are carried on rosters of various organizations of command. In addition, to be a part of the above records, should be kept a record of duties performed, qualifications military, professional and technical, and such other information as may be of value; consolidation of the morning reports of various organizations, and the check against records of office; the correctness of ration returns of separate organizations; the keeping of separate files of special and professional services of center.

The office is divided into sections, as follows: Detachment, dealing with center detachment; orders and leaves, dealing with entire subject in center; assignments, dealing with assignments based upon qualifications.

Fire marshal.—The center fire marshal is responsible for the proper distribution of his assistants, of the orders governing this division, and the instruction of the entire command in fire duties. He will divide the personnel of the center and each component unit into fire-fighting squads, and drill each in its duties to insure efficiency and uniformity, this being done daily until proficiency is attained; after that, weekly. He will make weekly inspection of fire-fighting apparatus, to insure its readiness for prompt use, and make to the commanding officer such recommendations for improvement in facilities as are needed. He will also make a weekly report to the commanding officer of the activities of his division.

Sanitation.—The duties of this division are under supervision of the commanding officer of the sanitary squad, who functions as center sanitary officer. He should make daily inspections of the center, paying particular attention to grounds, drainage, wastes, water supply, and internal sanitary conditions of units. The daily inspections should include messes and all that pertains to them, including prevention of waste and the carrying out of the directions of the commanding officer relating to messes. Upon the appearance of epidemic or contagious disease he should make exhaustive effort to determine the source and should make provision for its suppression, through the cooperation of other divisions

necessary to that end. He prepares the monthly sanitary report for the approval of the center commander. The sanitary squad, whose duties are given in another chapter, is under his control. These assistants are trained in inspections and in the repair of all sanitary apparatus, particular attention being paid to its conservation and proper working. If latrines or pits or tubs are used, the cleanliness thereof is insisted upon, care of them being given either to civilian employees or to enemy prisoners. Destruction of all waste which can not be used is carefully supervised, as is also the care of the incinerator. Careful inspection is made for prevention of fly breeding, by maintaining perfect police of garbage cans and horse standings or stables. Adequate measures are taken to prevent mosquito breeding. Ventilation and heating of wards are inspected and report made to the center commander if defects and deficiencies are found. In conjunction with the officer in charge of laboratories, search is made for "carriers" among those who have to do with the preparation and handling of food. If drinking water is not above suspicion, daily tests are made in cooperation with the laboratory section for the use and sufficiency of chlorination.

Evacuation.—In so far as it is applicable, this division bears the same relation to the center as the receiving and discharging officers of a general hospital, with such additional duties as the exigencies of the service may require. Through consultation with the proper authorities, the officer in charge keeps an up-to-the-minute list of available beds by classes. He is charged with responsibility for classified evacuations and the correct issuance of competent orders governing them. He keeps a record of all patients present and disposed of in the center each day. One study should be instructed in each unit in train, boat, and ambulance evacuation, both from the receiving and discharging side, and enlisted men detailed in each unit as litter bearers should be trained by him in their duties relating to boats, trains, and ambulances. When notified of the arrival of a train or boat, he must see that litter bearers and ambulances are on hand and that adequate supplies of blankets and hot-water bags are assembled at the platform. Having a list of vacant beds and receiving the list of patients from the train or boat commander, he is in a position to make prompt distribution of those received. Upon evacuation of the center, knowing the capacity of the boat or train, and having a list of evacuees by classes, he is in a position to embark or entrain them promptly. He turns over to the boat or train commander the list of patients evacuated, by classes. Before assuming his duties, he should, if possible, gain experience in evacuation work at an active evacuation hospital.

Motor transport.—The duties of the motor transportation officer are primarily the maintenance and repair of all motorized vehicles under his control. He instructs the personnel of the service in the duties required for proper operation of this service. He renders all reports required by this branch of the service, submitting to the commanding officer such requisitions for supplies currently needed to maintain the service.

Messes.—The mess officer, under direction of the commanding officer, exercises general supervision over all mess officers of the center and should hold such conferences with mess officers of separate units as may be necessary. He should make frequent inspections of organization messes as to operation and personnel, making such recommendations to the commanding officer as will provide for increased efficiency. He maintains a school for the instruction of cooks, helpers, mess sergeant, and others engaged in this class of work. He should keep informed upon the availability of local markets and the prices. He makes purchases for the separate hospitals and distributes the supplies purchased. He prepares the menus for the entire center and submits them to the commanding officer for approval two days prior to date effective.

Quartermaster.—The officer in charge of this important division is the group or depot quartermaster. He has general supervision over all the various quartermasters of the center. He makes daily inspections of all storehouses to see that stores are properly cared for, ample fire protection afforded, and precautions taken against loss. He supervises the preparation of requisitions before submission to the commanding officer for approval. He superintends the construction and repair of buildings, roads, walks, sewers, power plant, ice plant, laundry, etc. He inspects the supply officers of the center from time to time to see that they understand and perform their duties properly. He sees that troops are promptly paid and rationed,

that requisitions are promptly filled, and that ample stock is on hand at all times to provide for the needs of the center. He keeps a record of all reports that are required in his various sections, and sees that they are forwarded. He should cooperate in every way with the commanding officer and the heads of other departments. His office is divided into the following sections:

Rail transportation.—This furnishes transportation and travel allowance to troops, casuals, and men on leave status and routes them by the most practical routes; arranges for the movement of units from the center and notifies all concerned when the movement will take place. He receives and ships supplies and baggage, reporting daily by wire to the regulating officer the number of cars and kinds of supplies received and shipped; traces cars, express shipments, and baggage delayed and lost in transit; cares for all railway transportation department property at station; reports monthly to the chief quartermaster the amount and kind of transportation issued to the troops at the center; and reports to the central baggage office the data upon unclaimed baggage at the center.

Laundry.—Beyond having an expert personnel and civilian employees on hand, ironing and mending, this section needs no comment.

Subsistence.—The office force of this section makes requisition from class A-1 supplies upon a designated depot. He sees to the unloading, checking, and storage of supplies for sale or issue; issues rations on ration returns approved by the commanding officer; issues travel rations on travel orders issued by the commanding officer; sells commissary supplies to all who are authorized to make purchases. He supplies, on charge accounts to hospitals, subsistence stores required or which are authorized for sale; turns over daily the amount of cash received from cash and charge sales; abstracts the following day the articles sold for cash; abstracts during the month in which sold the articles sold on charge sales; makes the monthly abstract of subsistence stores sold, both charge and cash; abstracts at end of accounting month articles issued on ration returns or on special issue, etc. (See Manual for the Quartermaster Corps, and orders and circulars).

Property.—The officer in charge of this section is accountable and responsible for all property in his section. He prepares all requisitions for clothing, miscellaneous quartermaster supplies, fuel, forage, and ordnance, and supervises the issue of the same; sees that all salvage is collected and shipped; checks the property and ordnance accounts and returns; keeps informed by personal examination of the quantity and condition of property on hand and is responsible that it is reported upon his return; makes all reports called for.

Finance.—This section provides for all payments, handles the cash, keeps the cash books, examines all vouchers before payment, and renders all prescribed reports. The officer in charge is required to be bonded.

Maintenance.—This detachment is concerned with repairs and maintenance and is composed of carpenters, plumbers, electricians, and helpers, with a sufficient personnel to handle accounts, prepare food, and provide for police.

Salvage.—This division is under a small detachment of the Salvage Corps, which collects the miscellaneous articles deemed worthy of salvage and prepares them for shipment, turning the bundles over to the quartermaster for shipment to the designated depot.

Laboratory.—This division is under the charge of an officer responsible to the commanding officer for all the laboratory work of the center. He is in charge of the center and all subsidiary laboratories. He provides for distribution of all laboratory matériel of the center; makes recommendations to commanding officer to promote efficiency; indicates for commanding officer's approval the class of work to be done in the center laboratories; makes monthly consolidated report of all activities of laboratories in the center, with positive findings listed under proper headings.

The medical supply depot, base hospital, convalescent camp, evacuation ambulance company (ambulance company) and the sanitary squad are considered separately under appropriate headings in other portions of this manuscript.

IX

THE BASE HOSPITAL

(Numbered from 1 up)

Base hospitals of 1,000-bed capacity should be provided in the proportion of four to each division of an expeditionary force. These should be services of supply organizations, and in order to facilitate their supply and simplify the evacuation problem, should be grouped, as far as it is possible to do so, in centers of from 5 to 20 units.^a Hospital centers should be under the direct control of the chief surgeon of the forces, but detached base hospitals should be administered by the chief surgeons of the service of supply sections or army service area. Hospital centers and base hospitals should be located in army service areas, intermediate, and base sections at points offering the greatest rail and water facilities, advantage being taken of suitable existing buildings. The equipment of these units has been standardized to avoid the confusion inevitably created by personal predilection.

Base hospital projects approved for construction should be turned over to the construction service for completion. This construction should include proper sidings for hospital trains if rail facilities are available, water, lighting and disposal systems and adequate roads and streets. These hospitals should be prepared to give definitive treatment and so organized and equipped as to be in conformity with that idea.

It is essential that the operating surgeons be afforded opportunity to acquire a knowledge of battle casualty surgery, and to that end they should be assigned for periods to operating and attached to evacuation hospitals. Officers of the medical service, too, should be given similar assignments in order that they may become familiar with the care and treatment of toxic gas cases.

The commanding officer should insist that ward surgeons and chiefs of service realize the importance of correct and prompt preparation of case histories.

The officer in command of a base hospital should possess administrative as well as professional qualifications, and his office should have the following divisions. (It will be noted in this plan of organization that the office of director, having been considered superfluous, has been eliminated.)

Adjutant.—An officer of the medical administrative service should be detailed to this division to coordinate the work of the other divisions and their sections, to maintain the record files of the unit, prepare all communications arriving at or leaving the unit, to supervise the distribution of mail, and to conduct censorship of outgoing mail.

Guard.—This is exterior and is maintained by selected noncommissioned officers and enlisted men of the detachment according to roster, or from detachments from near-by line troops. The officer in charge of guard is charged also with policing of the unit area.

Records.—Concerned with maintenance of the miscellaneous records of the unit and statistical reports of the personnel.

Nurse Corps.—In charge of the chief nurse of the unit who controls the nursing service, making assignments to duty under authority of the commanding officer, and prepares all reports and returns relative to the nurses for approval and forwarding by the commanding officer.

Detachment.—Concerned with the orders relating to and assignments to duty of the enlisted personnel, and maintains the individual records of the detachment, and prepares the pay roll and muster roll.

Medical supply.—Under an officer of the medical administrative service, and concerned with the preparations of requisitions for replenishment for approval of the commanding officer, the receipt, storage, preservation and issue of medical supplies to the unit, and the maintenance of records pertaining to medical property as required by orders issued by higher authority.

^a These units are now designated as general hospitals. When not less than three general hospitals are operating in a group, the hospital center organization is authorized. See Tables of Organization, 683-W and 688-W.—Ed.

Religious and recreational.—Under control of the unit chaplain who, in addition to his spiritual welfare work, makes provision for the maintenance of reading and writing rooms, entertainments, games, both indoor and outdoor, assistance of the voluntary aid associations being solicited to this end.

Registrar.—In charge of an officer of the medical administrative service, who maintains the records of the sick and wounded, making the necessary alterations and additions, preparing them to accompany all evacuable cases or for forwarding to the chief surgeon's office in case of death, keeps the file of completed cases, and prepared sick and wounded cards of such cases for forwarding, prepares the daily statistical reports of the sick and wounded, and keeps a diary of the unit in which is entered from day to day all that transpires of interest, including orders involving movement of the unit.

Pharmacy, in which is maintained, under lock and key, the stock of those drugs and medicines capable of inducing drug addiction, and the nonhabit-forming medicines to be issued upon prescription, a file of prescriptions being kept for all issues and frequently scrutinized to preclude the unauthorized use of habit-forming drugs or intoxicants, check being made against the issues from the medical supply storeroom and the amount on hand in the dispensary.

Laboratory.—Equipped to perform the routine duties required in a large hospital, and divided into subsections for dealing with pathology—which includes the morgue—bacteriology, and serology, the latter being equipped for Wassermann and spinal-fluid tests.

Quartermaster, under an officer of the Quartermaster Corps, who is concerned with the supply of all articles and matériel not comprised in the medical supply, maintenance of the records and requisitions pertaining thereto. The office is divided into the following sections:

Disbursements, dealing with the pay, travel allowances, etc., of personnel and patients, and the pay of civilian employees. This officer is bonded, keeps the hospital fund, and prepares statements.

Supply and issues, dealing with the requisition for, the receipt of, issue of, and record of all property and supplies furnished by the Quartermaster Corps, including clothing.

Salvage, dealing with the collection of all equipment and matériel of every kind for sacking and turning over to the salvage officer of the center.

Laundry, heat and light.—Conducts these plants, with the assistance of civilian help, the laundry maintaining a linen exchange.

Transport, which cares for all transportation assigned the unit, and conducts this service under orders of the commanding officer.

Rations and messes, which draws and distributes the rations required, maintains supervision over the various messes, sees to the supply of fuel for them, and keeps the accounts.

Surgical service.—Under control of a medical officer of surgical ability who supervises the services. Subdivided into the following sections: Eye, ear, nose, and throat; genito-urinary; dental, including amillofacial; general, with its subsection of Roentgenology; orthopedic; head.

These services are dealt with under the heading "Hospital center."

Medical service, under control of a medical officer, who supervises the service. This is divided into the following sections: Neurological; general; contagious.

Convalescents.—In hospital centers convalescents are concentrated in a unit provided for their care.^b In detached base hospitals these patients are formed into a detachment under an officer of the medical administrative service who is known as the patients' detachment commander. He is responsible for their pay, clothing, discipline, nursing and amusement and recreation, all of which should be conducted through the proper agencies of the hospital.

^b A convalescent camp is authorized for each hospital center and normally should provide a capacity for 20 per cent of the normal capacity of the hospital center to which it pertains. See Tables of Organization, 685-W.—Ed.

X

SANITATION IN CAMPAIGN

From his induction into the service, through the vicissitudes of training camp, transport, and battle to his discharge, a soldier must be subject to the rules of sanitation if the force to which he is attached is to be effective. It behooves all officers, line and staff alike, to possess a knowledge of practical sanitation as applied to military life in contradistinction to the complex sanitation surrounding one in well-ordered civil life.

All must accept as axiomatic the statement that the sanitary apparatus found in profusion in civil communities and mobilization camps, for very obvious reasons may not be part of the sanitary equipment of a force in campaign, and that the successful field sanitarian must draw upon his fund of common sense and employ the simplest resources at hand which he must personally apply to the requirements, and not content himself with the issue of an order that often contemplates the use of matériel which is not obtainable.

Most literature upon sanitation of the Great War is based upon the trench system, which many deemed the normal, and as a result the literature is replete with descriptions of appliances in the trenches of all contending forces, leaving upon the reader an impression that war may not be prosecuted successfully without this mass of impediments to the transportation and use of which in open warfare he gives no thought. Successful warfare resolves itself into a question of mobility, and mobility signifies transportation. Therefore a military sanitarian must be gifted with vision broad enough to differentiate the essential from the nonessential, and must apply the well-known principles of sanitation to any form of warfare in a manner that will be productive of good, without laying himself open to the charge of being a nuisance through insistence upon the application of measures which a little thought would show to be impossible of performance.

The one and only object of field sanitation is to maintain a command in the most perfect condition of health compatible with military conditions, through reducing to a minimum the incidence of infectious diseases, by attention on the one hand to the individual and on the other hand to his environment.

Preparation of a soldier for his military service commences at the depot, where, if not previously immunized against smallpox, he is vaccinated and also inoculated against typhoid and paratyphoid, the efficiency of these measures having been proven beyond question. At the depot he is inculcated thoroughly with the necessity for personal cleanliness, involving attention to his teeth through use of the toothbrush, frequent ablutions of the body, washing of the hands after defecation and before going to meals, and the necessity for the prompt application of prophylactic measures after exposure.

Attempt is made to imbue him with the value of neatness in dress and care of clothes, with the double intent of improving his appearance and of creating a pride in the uniform, both reflexly arousing a desire for cleanliness of body and equipment. He is furnished with sufficient clothing, footgear, and personal equipment to make him fairly comfortable in the field, barrack, or billet except under the most extreme conditions, and is taught the care and use of his equipment in every phase of his new career.

Having acquired protection from the scourges that formerly decimated troops—smallpox, typhoid, and paratyphoid—and been taught the dangers of venereal infections and the surest means of precluding them, and through setting-up exercises and drills been made an up-standing, self-respecting man, the recruit is assigned to a command and enters upon his military career.

It is incumbent upon the medical officers at the depot to keep constant watch upon recruits, and particularly upon those from the rural districts, to detect the first symptoms of infectious diseases that most city-bred men acquire in childhood, and the methods of dealing with those infectious need no comment in a book of this nature.

The medical officers of the command to which the recruit is assigned must not be less vigilant in the detection of infectious disease than those at the depot, and frequent inspections must be made to weed out the infected or suspected, special attention being given cooks and those concerned in the handling of food to promptly detect and eliminate "carriers."

When the command to which the recruit has been assigned is designated for service, either at home or abroad, just before entraining the medical officers should thoroughly comb the command for detection and elimination of infectious disease, including, of course, venereal diseases. En route to another station, either by train or by boat, daily inspection of the command should be made to detect infectious disease and also to insure the proper preparation of food and provision for pure drinking water.

Arriving at a camp or port of embarkation, constant inspection is to be made with a view to prompt elimination of the infected, and just prior to embarkation, all the medical officers obtainable should make a most thorough inspection of officers and men to exclude the unfit or diseased from the transport; for it should be constantly in the mind of every medical officer that the worst nuisance on shipboard is a case of infectious disease and that the value of a command may be nullified absolutely by its presence.

Daily inspection of the men, the living quarters, lavatories and toilets, and kitchens and pantries of the transport must be thorough to insure the highest degree of physical cleanliness. Ventilation must not be overlooked, and suitable provision must be made for the thorough washing and rinsing in hot water of all mess kits.

Upon arrival at the port of debarkation the command should be placed in barracks for adjustment and further weeding out of the unfit, but the military exigencies usually demand prompt transit to the zone of activity, and in this case the medical officers need to redouble their vigilance for the detection and elimination of infectious disease. The men must be instructed to report at once the appearance of body lice, these pests always being encountered at this stage of the journey regardless of personal cleanliness of the command, for this species of vermin is always found on military routes. Medical officers need to bear in mind that from this time on the louse will be the constant companion of troops until facilities for its elimination are provided.

The command may be en route to a training area, where the men are usually billeted in villages, and in this situation the efficiency of the medical personnel has its severest test. Eternal vigilance over every factor in the soldier's life is necessary to maintain a command at the highest physical standard. Latrines have to be prepared and maintained in perfect sanitary condition, being made fly-proof as well, and for the first time the medical officer realizes that such aids as crude oil, lampblack, or lysol are unobtainable, by reason of the difficulty in transport, and that his sole recourse is perfect mechanical cleanliness and constant instruction and supervision for its maintenance.

Of equal importance is the supply of water for drinking, and instead of waiting for the usual pronouncement of the bacteriologist upon the purity of the water, he should at once assume that it is impure and should see to the prompt installation of Lyster bags and the correct process of chlorination, at the same time placarding all other sources as dangerous, and he should see that guards are stationed to enforce his orders.

Billets should be examined for their capacity, 40 square feet per man being the minimum, and if ventilation is inadequate steps should be taken at once to provide the necessary amount.

Kitchens are to be maintained in scrupulous cleanliness and facilities for the washing and rinsing of mess kits installed, two galvanized-iron cans, one with hot, soapy water and the other with plain water, being sufficient for each company. Provision has to be made for the drying of clothes and shoes in each company, and if no room is obtainable for this purpose construction must be instituted. A small stove, with wires or lines strung across the space for suspending wet or damp clothing, being sufficient for the purpose.

Bathing facilities should be installed, and if a portable shower bath is not obtainable, recourse can be made to perforated tin boxes suspended in a convenient place, with simple facilities for heating water.

Kitchen and stable waste must be disposed of without creating a nuisance or permitting flies to breed.

Should the command be under canvas—which would be unusual in a foreign country—the requirements outlined herein would obtain, tents being substituted for billets.

The venereal rate always reaches its highest point in rest and training areas, and prophylaxis stations conspicuously marked must be provided in sufficient number, and records should be inspected daily. As sexual intercourse is a habit and not a necessity for soldiers,

advice in regard to abstention from it is seldom heeded and all known houses of prostitution should be placed off limits, with a guard to enforce the order, and prompt and adequate punishment instituted for failure to observe orders concerning prophylaxis and the reporting of venereal disease, for it should be borne in mind that all venereal disease can nullify the military value of a command as quickly as an epidemic of infectious disease.

In every training area is located a camp hospital of about 300-bed capacity, and all cases of disability should be promptly transferred to it.^c Uncomplicated venereal cases, however, should be formed into a venereal battalion segregated from the remainder of the command. This battalion should not only receive intensive training under supervision of a competent urologist but should also be subjected to disciplinary control and given approximate police duties. In this way perfect control is exercised and the diseased isolated from the well with a view to the sudden transference of the command to another sphere of activity and the avoidance of confusion in segregation at the last moment. This system of segregation should be enforced during the entire period of the life of the command, whether in the front line or back areas. When the command is assigned to the front line its location is usually reached by marching, and medical officers must exercise constant vigilance for elimination of the unfit, must see to it that straddle trenches are provided, food and water surrounded by adequate precautions, and resting places properly policed upon departure.

As the command approaches the front line, facilities for personal cleanliness and waste-disposal become fewer; so care must be observed to dispose of waste in a manner that will not prove a menace or a nuisance to succeeding commands or to the civil population, and recourse must be had to prevent as much as possible the infestation of the command with lice, for these insects, feeding twice daily and multiplying with astonishing rapidity, may soon reduce the stamina of the command through the loss of sleep consequent upon irritation from the bites, which become infected and invite disaster should the victim be wounded. Literature on the subject is full of suggestions for the easy freeing of a command from these pests, but what is possible in trench or stable warfare is impossible in a marching column or in open combat, and it needs but little thought to understand the absurdity of attempting to use the heavy, clumsy and slow disinfestors which are the *pièce de résistance* of most writers upon sanitation in war under the latter conditions. The reader should firmly fix in his mind the fact that trench warfare is an unfortunate incident which is an open confession of the lost power of offense and is the last objective that any military commander desires or would permit if he had the power to make other choice.

The question for medical officers to decide when a command en route to or entering the line of combat is infested is what simple measures can be employed to reduce if not to entirely destroy these vermin, and the solution is found in the employment of hot flatirons over damp clothes, pressed upon the seams of clothing and underwear, and the use of certain drugs which are repellant to lice. With the knowledge that the command will be deprived of steam disinfectors in forward areas, each company should have on hand two flatirons and cloths and a quantity of naphthalin, creosote and iodoform for dusting upon the inside of clothing with happy effect. The hot iron pressed over damp cloth immediately destroys both adult and egg, while the N. C. I. [naphthalin, creosote, and iodoform] powder applied biweekly will act as a deterrent to further visitation. But the most efficacious and least unpleasant deterrent is ordinary tar soap, which wet and rubbed on the seams of clothing repels not only lice but also fleas; and as a cake of this soap used in this way will last a long time and is inexpensive, every soldier should have one in his kit and provision be made for replenishment. This use of tar soap was most successful in preventing infestation of the China contingent during the typhus season in 1912, 1913, and 1914, when the disease was rampant among the natives, and lice were omnipresent.

Having arrived at the front line, the command may enter either trench or open warfare, and if the latter, the conditions obtaining during the march must continue until the command is withdrawn to a rest area well behind the line, where facilities should be available for thorough bathing, delousing, and reclothing, and where a more or less quiet military life may be enjoyed.

^c Hospitals of this type are now designated station hospitals and have a normal capacity for 250 patients. They are communications zone units. See Table of Organizations, 684-W.—*Ed.*

Trench or stable warfare imposes conditions upon a command in which it lives and fights in a very restricted area, in which death or injury is always imminent, and where, for obvious reasons the most perfect sanitary conditions must be maintained. As even in the quietest sectors, life in the trenches is none too enjoyable, it behooves the units occupying them to observe strictly the common-sense principles of mechanical cleanliness for their own sake as well as for the sake of units which succeed them, for otherwise conditions would speedily become intolerable. To that end provision must be made for the disposal of human waste, and such provision must naturally be placed so as to be readily accessible and yet offer protection from injury by the enemy.

With the knowledge that a command is to occupy trenches, the medical officers and quartermasters should prepare the simple equipment beforehand, and upon relief this equipment should be turned over as sector property. Latrines being out of the question in firing and support trenches, either oil drums, cracker boxes, or buckets should be provided, to fit snugly against the top of a box with a hole and a lid, the whole made fly-proof and placed for accessibility in an outshoot on the communicating trench and behind the support trench. If obtainable, a 5 per cent solution of cresol in water should be placed in each receptacle; otherwise, wood ashes should be provided in a box for a covering layer for each increment. Two of these receptacles are sufficient for each company, first firing and support trench, a similar receptacle being placed opposite in an outshoot, for officers.

In an outshoot from the communicating trench between the first firing and support trench should be dug a urine-soakage pit 4 inches in depth and width, the hole filled with small stones, broken bottles, or flattened tin cans, over which is thrown a thin layer of porous earth or sand, this being covered with gunnysacking, if handy, the surface being kept moistened with 5 per cent cresol if obtainable. Another of these pits should be placed between the feces receptacles for the men behind the support trenches, but none should be used if the soil is not porous. Latrines of the usual type may be dug farther back of the communicating trenches for use of the reserve, and these should be in dugouts, for protection.

Care of these receptacles should be exquisite, and men detailed for this duty should not be selected for punitive reasons but for their intelligence and zeal, and the fact should be impressed upon the command that this duty is just as necessary as a detail in the firing trench, for buckets or boxes must be emptied frequently and their contents carried the entire length of the communicating trench for disposal in one of the dugout trenches, and sometimes for a long distance behind that point.

Cooking in the front firing trenches is out of the question, as smoke and light immediately draw enemy fire. Food and water must therefore be brought from a distance, heat being maintained by the use of marmites. These are merely one receptacle within another, enough space being left between for an insulating layer of felt or hay. Too much care can not be expended upon marmites, for unless kept scrupulously clean they cause food fermentation. With this fact in view it is far better to provide them ready-made, with smooth inner container and a complete juncture between the inner and outer shell to preclude soiling of the insulating material; an accident invariably occurring in improvised marmites.

The usual period of trench service is four days, this being the longest period that the enervating duty may be performed without detriment to a command, though in times of stress the period is prolonged; and as the men may not leave the trenches for any purpose while able to perform duty, facilities for washing hands and face must be provided (as much for the sake of appearances as for the stimulating effect of the water) and a few basins provided as part of the equipment, water being brought to the trenches by a detail assigned that duty.

Drinking water must be chlorinated carefully, and a Lyster bag is necessary for each company. Depending upon the length of its occupancy, the trench may be a simple ditch or one provided with small dugouts containing bunks, stoves, lanterns, stools, tables and whatnot, and provided also with gas curtains. But whatever the nature of construction, if occupancy has been long the whole system is sure to be infested with vermin and with rats, and as men may not remove their clothing with impunity, the value of vermin repellants is enormous. Rats may not only constitute a menace by their presence but a menace as well through their bites and their fleas; and while the latter may be remedied by the use

of tar soap on the clothing, energetic measures are necessary to reduce rodents, large numbers of traps and the extensive use of phosphorus pastes being given preference. The use of lice and flea repellants is not only indicated for the comfort of the men, but it should be remembered, too, that the enemy may be afflicted by typhus and plague, and prisoners taken in trench raids may be the means of starting an epidemic spelling disaster.

Great care must be observed in trench life to detect and remove promptly any case of infectious disease, for the close contact of the men makes dissemination rapid, particularly in those diseases communicated through the medium of the mouth and nose secretions. All such cases should be promptly masked before their removal to a hospital, and contacts similarly made innocuous to others.

As trenches are open, both rain and ground water enter, and in spite of duck boards the men's feet are always wet and if the temperature is not very warm the constant maceration of the skin, with compression from shoes, socks, and puttees, gives rise to "trench foot," which, after the various theories have been discarded, still remains the old-fashioned chilblains and adds immeasurably to the victim's discomfort. To prevent this condition, the men's feet should be kept as clean as possible and whale oil or any other grease rubbed in with prolonged friction. Above all, means must be provided for the drying of shoes the minute a man is relieved from his post, and every man should have an extra pair of shoes and socks, so that he will always have one pair dry.

Having survived the ordeal of trench life, the command is relieved—for obvious reasons always at night—and is marched back to a rest area, where it should be afforded facilities for bathing, delousing, and reclothing.

Should the fortunes of war permit the command to give over trench warfare and take up offensive in the open, or even to pursue the enemy, exhausted nature requires its relief by a fresh command, and upon relief it goes into rest.

Whatever the situation, medical officers should not relax their vigilance for a moment, for a fatigued command is more susceptible to infection than is a fresh one, and as during rest periods replacements may impart all manner of infections, the greatest care devolves upon medical officers at this time. Upon appearance of the first case of infectious disease the victim and his contacts must be segregated and dealt with according to the nature of the disease. Diseases which are disseminated by nasal and mouth secretions demand that those who have them and all who have been exposed to them be masked at once and before anything else is done.

Upon completion of a campaign a command reverses the steps outlined herein, ever under the watchful eyes of the medical officers, and before being demobilized and returned to civil life it must be held in detention sufficiently long to free it from any disease which would be a menace to those in the homeland.

CIRCULARS PROMULGATED BY THE CHIEF SURGEON, A. E. F.

Circular No. 1, 1917.

HEADQUARTERS AMERICAN EXPEDITIONARY FORCES, CHIEF SURGEON'S OFFICE.

It is planned that the medical laboratory work for the American Expeditionary Forces shall be done by the following organizations:

1. Field laboratories, located in each division camp hospital, will do all work that it is possible to do for the division and for the camp hospital, and will send other work to an army laboratory.

2. Army laboratories will do the bulk of the work for the troops in the field including water analyses, Wassermann reactions, detection of carriers, cultural and serological work in general. These laboratories may be specialized later. Laboratory No. 1 is already established, address P. O. No. 709.

3. Laboratories of base hospitals will do principally routine and special work for cases in hospital.

Specimens from each division should be sent to the field laboratory at the camp hospital of the division for examination or transmittal to the army laboratory. As soon as containers for specimens are available they will be kept on hand at the field laboratories for distribution.

Pneumonia.—Type determination of pneumococci should be carried out whenever possible in cases of lobar pneumonia. Sputum should be sent to the army laboratory direct, with as little delay as possible.

Syphilis.—Specimens for Wassermann reactions will be sent to United States Army Laboratory No. 1, through division laboratories.

DIPHTHERIA AND MENINGITIS

Sporadic cases of diphtheria and meningitis are to be expected and do not call for medical preventive measures. But if secondary cases occur in the same group of men, such radical measures will be undertaken as the limitations of field conditions permit.

Diphtheria.—1. Any clinically suspicious case will be cultured on Loeffler's media, and the culture will be sent to the division laboratory as soon as possible. The case should be treated with serum if sufficiently suspicious and sent to the camp or base hospital for isolation.

2. If the culture is reported positive, immediate contacts will be examined clinically each day for one week and cultures made in any suspicious cases. Isolation, the prophylactic use of antitoxin, and examination for carriers among contacts are not indicated after sporadic cases. Inquiry should be made as to the existence of diphtheria in the civil population, especially among the children of the neighborhood.

3. If secondary cases occur in the same group of men, contacts will be isolated and examination for carriers will be requested through the division laboratory.

4. If cultures on contacts are negative they will be released from isolation. Carriers will be sent to the camp or base hospital. If virulence tests can be made on carriers and are negative, the carriers will be released; otherwise, two negative cultures at intervals of three days will be required before release.

Meningitis.—1. Any clinically suspicious cases will be given a spinal puncture as soon as possible and the fluid sent to the laboratory. The case will be given serum treatment if sufficiently suspicious and sent to the camp or base hospital for isolation.

2. If meningococci are found in the fluid by smear or culture, contacts will be kept under clinical observation for three weeks and spinal punctures will be made in all suspicious cases.

3. If secondary cases occur in the same group of men, contacts will be isolated and examination for carriers will be requested through the division surgeon.

4. If cultures on contacts are negative they will be released from isolation. Carriers will be sent to a base hospital for isolation and treatment. Two negative cultures with intervals of one week will be required before convalescents or carriers are discharged from hospital.

A. E. BRADLEY,
Brigadier General, N. A., Chief Surgeon.

Circular No. 2.

(This circular will be superseded by Circular No. 25 which will soon be issued.)

Circular No. 2.

HEADQUARTERS AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON,
France, November 9, 1917.

1. The War Department has approved the plan of the Surgeon General's Office, creating professional divisions in his office with a director at the head of each division in the United States, and a director for each division with the American Expeditionary Forces. These divisions are:

- (1) Division of general medicine.
- (2) Division of general surgery.
- (3) Division of orthopedic surgery.
- (4) Division of surgery of the head.
- (5) Division of venereal, skin and G. U. (urology).
- (6) Division of laboratories.
- (7) Division of psychiatry.
- (8) Division of Roentgenology.

2. For the expeditionary forces, Maj. John M. T. Finney, M. R. C., has been designated as director of general surgery; Maj. Joel E. Goldthwait, M. R. C., as director of orthopedic surgery; Maj. Hugh H. Young, M. R. C., as director of urology; and Lieut. Col. Joseph F. Siler, M. C., as director of laboratories. The names of officers designated for the remaining divisions will be announced later.

Additional officers will be named from time to time as assistant directors and consultants for corps, sections of the lines of communication, large hospital centers, and other areas.

3. The professional authority of directors, assistant directors, and consultants, within their respective divisions, will be recognized by all concerned and duly respected and observed, it being fully understood that this authority does not in any way include administrative control.

4. The directors, each for his particular division, will be immediately responsible to the chief surgeon, A. E. F., for the work performed in these various divisions. In general, they will direct and coordinate the professional service of all sanitary formations and hospitals so that there will be a continuity of treatment along lines of recognized approved practice, from the front to the rear, in each professional division.

They will also act as consultants and advisors, and, when necessary in the interest of the service, they will change professional procedure or inaugurate new methods.

5. In order to carry out these plans, the professional service of base hospitals and general hospitals, and other hospitals as far as practicable, will hereafter be subdivided into eight sections, as follows:

- (1) Section of general medicine.
- (2) Section of general surgery.
- (3) Section of orthopedic surgery.
- (4) Section of surgery of the head.
- (5) Section of venereal, skin, and genitourinary (urology).
- (6) Section of laboratories.
- (7) Section of psychiatry.
- (8) Section of Roentgenology.

The commanding officer of each hospital will organize his hospital as indicated, assigning a suitable officer to duty in charge of each section. He will assign an adequate number of assistants to each section as far as it may be practicable. In making these assignments the professional qualifications of an individual in a particular specialty will receive due consideration. The chiefs of sections will report direct to the commanding officer, to whom they will be responsible, each for the satisfactory operation of his particular section.

By command of General Pershing:

A. E. BRADLEY,
Brigadier General, N. A., Chief Surgeon.

Approved:

J. G. HARBORD, *Chief of Staff.*

Circular No. 3.

HEADQUARTERS AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON,

November 24, 1917.

The following instructions are issued for the guidance of all medical officers:

1. Cases of slight illness which apparently will require but a few days on sick report, and cases of uncomplicated venereal diseases which can not receive proper care on a duty status, will be treated in camp infirmaries as far as the capacity of the camp infirmary will permit.

2. Cases of a more serious nature will be sent to camp hospitals of the divisional training areas. These will include the overflow of the mild cases from the camp infirmaries and those who will require retention on sick report for more than one week.

3. Cases of a severe nature that will require hospital treatment for a period of more than two weeks or cases for which there is inadequate equipment at camp hospitals and those that require experienced nursing will be promptly evacuated to base hospitals. It is not intended that all mild cases which will require hospital treatment for a period longer than two weeks must be evacuated to base hospitals, but two weeks is placed as a reasonable time limit for their retention in camp hospitals and is intended to serve as a guide.

4. In this connection attention is called to paragraph 4, General Orders, No. 34, Headquarters A. E. F. No uncomplicated cases of venereal disease will be sent to base hospitals.

By command of General Pershing:

A. E. BRADLEY,
Brigadier General, N. A., Chief Surgeon.

Approved:

J. G. HARBORD, *Chief of Staff.*

Circular No. 4.

HEADQUARTERS, AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON,

France, December 22, 1917.

The following instructions relative to charges for certain classes of dental work requiring precious metals and other expensive materials not furnished by the Government are issued for the guidance of all concerned.

1. It is contemplated that dental officers on duty at general headquarters, headquarters line of communications, division headquarters, separate brigade headquarters, army sanitary school, the several base hospitals, A. E. F., and general hospitals, B. E. F. (where there are complete laboratory equipments) will carry these materials.

2. The following list of fixed charges to reimburse dental officers using these supplies is announced, same being based upon the actual cost (in France) of materials necessary for the designated class of work, plus a small per cent to cover construction losses.

3. List of charges:

Gold fillings:		Molars—	
Simple.....	\$2. 00	Swaged cusps.....	\$6. 00-7. 00
Compound.....	2. 50-3. 50	Solid cast cusps.....	7. 00-8. 00
Gold inlays:		Gold-porcelain crowns.....	5. 00
Simple.....	3. 00-3. 50	(Richmond, Goslee, Steele, or Ash fac-	
Compound.....	4. 00-5. 00	ings, and bridge dummies)	
Gold shell crowns (gold bridge dummies):		Porcelain crowns, with cast	
Bicusps—		gold base.....	\$3. 00
Swaged cusps.....	5. 00		
Solid cast cusps.....	6. 00		

Bridges: Charges to be based upon foregoing figures covering components, i. e., abutment crowns, inlay anchorages, and dummies, plus a charge for consolidation not to exceed \$1 for each interproximal space soldered.

By command of General Pershing:

A. E. BRADLEY,
Brigadier General, N. A., Chief Surgeon.

Approved:

J. G. HARBORD, *Chief of Staff.*

Circular No. 5.

HEADQUARTERS, AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON,
France, January 15, 1918.

DUTIES OF MEDICAL OFFICERS DETAILED AS PSYCHIATRISTS IN ARMY DIVISIONS IN THE FIELD

1. The following outline naturally does not indicate all the means by which medical officers detailed as psychiatrists in Army divisions in the field can be of service in dealing with the difficult problems arising in the diagnosis and management of mental and nervous diseases among troops. These officers are under the direction of the chief surgeons of the divisions to which they are attached, and they must be prepared at all times to render such services as he may require. These officers are not members of division headquarters staff. They are attached to the sanitary train.

2. It is essential for such officers to bear in mind the prime military necessity of preserving or restoring for military duty as many as possible of the officers and enlisted men who may be brought to their attention. On the other hand, they should recommend the evacuation, with the least practicable delay, of all persons likely to continue ineffective or to endanger the morale of the organizations of which they are a part. This is particularly true in the case of the functional nervous disorders loosely grouped under the term "shell shock," but more properly designated as war neuroses. Psychiatrists detailed to this duty have an unique opportunity of limiting the amount of ineffectiveness from this cause and of returning to the line many men who would become chronic nervous invalids if sent to the base. At the same time they can bring to the attention of other medical officers and company commanders individuals who possess constitutional mental defects of a type which make it certain that they will break down under stress.

3. Specific duties which may be performed by psychiatrists in Army divisions are as follows:

(a) Examine all officers and men under observation or treatment for mental or nervous diseases in regimental infirmaries, field hospitals, camp infirmaries, and other places, and to advise regarding their diagnosis, management, and disposition.

(b) Examine all mental or nervous cases in the divisional areas when directed to by the chief surgeons or requested to by other medical officers or company commanders.

(c) Examine and give testimony regarding officers and men brought before court-martial or under disciplinary restraint, when directed or requested by competent authority.

(d) Give informal clinical talks to groups of medical officers in the divisions to which they are attached upon the nature, diagnosis, and management of the mental and nervous disorders peculiar to troops.

(e) Keep careful records of all cases examined.

(f) Make such reports to the chief surgeons of divisions as they require and to make monthly reports of their operations to the director of psychiatry, bringing especially to his attention any matters likely to increase the efficiency of this part of the medical work of the American Expeditionary Forces.

By command of General Pershing:

A. E. BRADLEY,
Brigadier General, N. A., Chief Surgeon.

Approved:

J. G. HARBORD, *Chief of Staff.*

Circular No. 6.

GENERAL HEADQUARTERS, AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON,
France, January 28, 1918.

1. The attention of medical officers, A. E. F., is directed to the absolute necessity for the prophylactic administration of antitetanic serum (A. T. S.) under the following conditions:

(a) Immediately after the receipt of a wound of whatever character, if a battle casualty, preferably at the regimental aid station.

(b) Upon the recognition of so-called "trench foot" with or without skin abrasions.

(c) During operations performed under conditions of unsatisfactory asepsis, e. g., emergency operations, operations for hemorrhoids, or when there has been contamination from the contents of the large intestine.

(d) During secondary operations necessary in the course of the treatment of wounds received 10 or more days previously.

(e) Following manipulations incident to the reduction of compound fractures or dislocations, after the removal of adherent drains, or any other procedure resulting in a serious disturbance to the healing tissues consequent upon a wound 10 or more days old.

2. One dose of 1,500 units is sufficient, and should always be administered under any of the above conditions. It should be injected subcutaneously, preferably over the lower abdomen.

3. The serum should be administered by or under the immediate supervision of a medical officer. If for any reason this is impossible, it should be given by some responsible member of the Medical Department.

4. A record of the administration is to be made upon the individual's diagnosis tag and clinical record by the letters A. T. S., followed by the date and hour; in the case of the freshly wounded, the letter T should be plainly marked upon the forehead with an indelible pencil.

5. Absence of any records on the patient's card or face as indicated in the preceding paragraph is to be accepted as evidence that the A. T. S. has not been given. The first medical officer to assume subsequent control of a patient thus neglected should administer the serum immediately.

6. Medical officers, who are thus compelled to administer A. T. S. because of the failure of any medical officer or officers previously responsible for this administration to carry out the above instructions, must make an immediate report of such omissions to the chief surgeon, A. E. F., through the director of general surgery, with sufficient data to establish the time and circumstances of the omission.

A. E. BRADLEY,
Brigadier General, N. A., Chief Surgeon.

Circular No. 7.

GENERAL HEADQUARTERS, AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON,
France, January 28, 1918.

1. The following detailed instructions supplementing and amplifying General Order No. 43, headquarters, A. E. F., September 30, 1917, and General Order No. 74, December 13, 1917, and relative to requisitions and finance papers, are published for the information and guidance of all concerned.

2. Accountable officers of base hospitals and sanitary schools will not be affected by the provisions of the paragraphs of this circular, in so far as they apply to property responsibility and accountability.

3. All accountable officers of Medical Department units coming under chief surgeons of divisions will at once invoice upon Form 28, M. D., all property of whatever nature for which they are accountable, to their respective divisional medical supply officers. Under the supervision of the chief surgeons of divisions this property will be issued and held upon memorandum receipt, Form 28, M. D., so modified as to meet this need.

4. The medical supply officer of each division will prepare, after this transfer has been completed, accurate final returns upon Forms 17, 17a, 17b, and 17c, in duplicate, of all equipment, property, and supplies for which he may then be accountable. The upper certificate upon Form 17c will be used by the officer completing the final return, the lower form, as modified, by the officer making final inventory. One copy will be retained and one copy forwarded to the chief surgeon, line of communications.

5. There will be detailed by the chief surgeon of each division a disinterested officer of the Medical Department and senior to the Divisional medical supply officer, if practi-

cable, to make personally a complete physical inventory of balance of supplies, property, and equipment on hand at time of final return. The officer making this count will certify to the facts on the final return.

6. Accountable officers of Medical Department units, not under chief surgeons of divisions, will proceed as per instructions contained in paragraph 4 above, and subparagraphs 1 and 2, paragraph 1, General Order No. 74, above quoted. These final returns will be made in duplicate and one copy retained by the accountable officer and one forwarded to the chief surgeon, line of communications.

7. For the method of the invoicing of and receipting for equipment, property, and supplies from depots to units, divisional or otherwise, attention is invited to paragraph 10, General Order No. 43, headquarters A. E. F., September 30, 1917.

8. Requisitions for all property listed upon tables of supply will be made for divisional units in quadruplicate, and in all other cases in triplicate upon Forms 33, 35, or 36, M. D. In each case one copy will be retained and the others forwarded for action. Requisitions for blank forms will be made as in the past upon Form 37 and for all organizations but one copy forwarded for action.

9. All equipment, property, and supplies needed for use of divisional units will be requisitioned for by the divisional medical supply officer, and his requisitions will be forwarded to the chief surgeon of that division for his action. The chief surgeons of divisions will forward all approved requisitions, or those approved as modified, except for transportation as noted in paragraph 11, direct to the officer in charge of the issuing depot. The same disposition will be made of requisitions from organizations other than divisional, and with the same exception. The chief surgeon, line of communications, will publish from time to time detailed instructions relative to the exact depot to which requisitions from the various units should be sent. These instructions will also contain a statement of policy as regards "articles due."

10. Requisitions or requests for transportation of any kind whatever will be forwarded in every instance to the chief surgeon, line of communications, through divisional chief surgeons in the case of such units and direct in all other cases. These instructions will also govern where special or unusual equipment, supplies, or property are required.

11. All unserviceable property of whatever class will be disposed of ultimately through the salvage service. Such property will, however, for the present be held awaiting further instructions from the office of the chief of the salvage service.

12. Where purchases and payments are made necessitating the use of public voucher forms, great care will be exercised to see that the signature of individuals to whom payments are to be made are in accordance with the name of the party or company to whom the United States is declared debtor. The vouchers will show clearly upon their faces the authority for the purchase and the rate of exchange used in figuring totals. These totals will, in all cases, be made in terms of United States currency.

13. The public vouchers referred to above will be made in duplicate and accompanied by the proper forms. In cases where the purchase has been made under the supervision or authority of a divisional chief surgeon, the vouchers will be sent to that office for visa and approval after which they will be sent direct to the proper disbursing officer for payment. The papers referring to transactions not falling normally within the province of divisional chief surgeons will be forwarded to the chief surgeon, line of communications, for final action.

14. The chief surgeons of divisions may authorize ordinary and emergency expenditures of public funds for their own department in amounts not to exceed \$100. All such expenditures so authorized will be reported to this office monthly upon a consolidated list showing the larger groups and not each individual item.

A. E. BRADLEY,
Brigadier General, N. A., Chief Surgeon.

MODIFIED FORM C, MEDICAL DEPARTMENT

I certify that the foregoing return, slips Nos. ---- to ----, inclusive, is a true and correct statement of all medical property for which I am accountable for the period ending -----, 191--; that the expenditures for which credit is claimed therein were made in strict accordance with regulations.

Accountable Officer.

Final return of medical property, ----- Division, A. E. F., per G. O. 74, H. A. E. F. December 13, 1917.

I certify that I have this ----- day of -----, 191--, made a complete personal physical inventory of all property enumerated upon slips Nos. ----- to -----, for which the above officer is accountable and find the total balance on hand to be as stated in the above certificate with additions and subtractions as indicated upon my list here attached.

Inventory Officer.

Final return of medical property, ----- Division, A. E. F., per G. O. 74, H. A. E. F. December 13, 1917.

Circular No. 8.

GENERAL HEADQUARTERS, AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON,
France, February 4, 1918.

The following information is published for the guidance of all concerned:

* * * * *

1. There arrived at -----, 7.25 p. m., January --, 61 enlisted men of this division. These men were in charge of Sergeant -----, Headquarters Company, ----- Infantry. They were all being returned to duty from Base Hospital No. ----- Copy of order and written instructions to Sergeant ----- hereto attached. (See Exhibits A and B.)

2. These men were not furnished with rations when they left the hospital; and as very few of them had any money, the large majority went without anything to eat from 6.10 a. m. to about 8 p. m. No notification was sent to the authorities at ----- from Hospital No. ----- to expect these men, and when they arrived, about 8 p. m., there was therefore no provision for taking care of them until they could be forwarded to their respective organizations.

3. Many of the men were without sufficient warm clothing, according to the sworn statement of Sergeant -----, as well as my own observation.

4. Sixteen of the men were admitted to the camp hospital here immediately on arrival. Thirteen of them were returned to duty next day, but three were found to require hospital treatment. (See Exhibit C.)

5. It is recommended that steps be taken to require the hospital authorities to see that men discharged from a hospital are warmly clothed on leaving, and to provide for rationing such men for the trip back to their organizations. Also that they notify by telegram the authorities of any intermediate station where such men must be taken care of on their journey back to their organizations.

* * * * *

The recommendations set forth in paragraph 5 above will be strictly observed. The general staff at these headquarters is now engaged on the preparation of an order that will cover an automatic method of returning men from hospital to duty.

A. E. BRADLEY,
Brigadier General, N. A., Chief Surgeon.

Circular No. 9.

GENERAL HEADQUARTERS, AMERICAN EXPEDITIONARY FORCES,

OFFICE OF THE CHIEF SURGEON,

France, February 7, 1918.

The following memorandum has been issued by the Surgeon General, and as far as it is applicable will be observed by all concerned in the American Expeditionary Forces:

Memorandum for all division surgeons, and surgeons at ports of embarkation, and for commanding officers of general, base, embarkation, and other hospitals:

Reports of inspectors indicate lack of uniformity in the care and isolation of infectious disease in hospitals, and in many instances the steps taken are reported to be insufficient to prevent possible spread of infection and development of complications. The following procedure should be followed whenever local conditions permit. When any or all of the necessary medical department material is lacking, requisition should be made by telegraph for the needed articles, and referring to this memorandum as authority. Such additional precautions should be taken as are deemed advisable by the commanding officer of the hospital.

1. *Meningitis*.—Strict isolation should be instituted. Male attendants should be segregated and not allowed to eat or sleep with the sanitary detachment. The same steps should be carried out with female nurses as far as possible. When on duty in wards all female nurses, male attendants, and medical officers should wear operating gowns, caps, and gauze masks over nose and mouth. The hands should be thoroughly washed and disinfected after coming off duty and before leaving the ward. Cultures should be taken every fourth day from medical officers, nurses, and male attendants on duty in meningitis wards, and no such nurse or attendant should be assigned to other duty until a negative culture is obtained. Bedding, clothing, etc., of patients and gowns and caps of attendants should be thoroughly disinfected by steam or chemicals before going to the laundry. Nasal and oral discharges of patients should be disinfected or burned. Dishes, etc., for bringing food should be sterilized before being returned to the general kitchen. Meningitis convalescents and carriers will not be returned to duty until after three consecutive negative cultures taken at intervals of from 3 to 6 days. Meningitis carriers should not be segregated in the same room with men sick with meningitis, but in a suitable segregation ward, camp, or barrack.

2. *Diphtheria*.—The same precautions should be taken as prescribed for meningitis. In addition, the Schick test should be applied to nurses and male attendants, and those not immune should be immunized.

3. *Measles*.—An allowance of at least 1,000 cubic feet per patient should be provided in wards or barracks used for treating measles patients. Wires should be arranged across measles wards and sheets, or newspapers, hung over these in such a way as to form a screen between each two patients; or some other suitable screening arrangement should be provided. This is with a view to preventing spread of pneumonia by droplet infection during coughing. Patients convalescent from measles should be retained in hospital, or in a well-warmed convalescent barrack, for at least 10 days after the temperature has permanently returned to normal. Medical officers, nurses, and male attendants in measles wards will wear gowns, caps, and masks. Nasal discharges and sputum of patients will be disinfected. Oral cleanliness should receive special attention. Attendants who have had measles should be selected, if possible, for duty in measles wards. Floors of wards should be gone over daily with a cloth wet in disinfectant. Dishes and eating utensils should be disinfected. Individual drinking cups should be used. Particular care should be taken to disinfect thermometers and other utensils as they pass from patient to patient. Wards should be kept warm. A urinary examination should be made before discharge from hospital.

Patients developing pneumonia should immediately be removed from the measles wards. They should *not* be placed in the same wards with primary lobar pneumonia.

4. *Pneumonia*.—Pneumonia patients should be treated in wards used exclusively for pneumonia. Ordinary lobar pneumonias and post-measles and post-scarlet-fever pneumonias should not be treated in the same wards. At least 1,000 cubic feet of air space per patient should be provided, and all of the precautions referred to in the section on measles should be carried out, viz, gowns, caps, masks, screens between beds, disinfection of utensils, thermometers, excretions, and floors. Convalescent pneumonia patients should use a mild antiseptic mouth wash as long as they remain in hospitals, and should pay special attention to oral hygiene. Special attention should be given to the early detection of empyema.

5. *Scarlet fever*.—All of the precautions prescribed in measles should be carried out in the treatment of this disease. Attendants who have had scarlet fever should be selected when possible.

Patients should not be released from quarantine until nasal, aural, glandular, or other abnormal discharges have ceased, and all open sores have healed, nor earlier than six weeks after the onset of the disease under any circumstances. A urinary examination should be made before discharge from hospital.

6. *Smallpox* patients should be handled with the same precautions as meningitis, and in addition all attendants, and others in the vicinity, and all contacts should be revacci-

nated. Smallpox may safely be treated in a room in the isolation ward if these precautions are observed.

7. Where the hospital facilities are insufficient to provide treatment for measles and scarlet fever patients for the periods above prescribed, request should be made for the setting aside of the necessary barracks or tentage for use as convalescent hospitals. Special attention should be given to keeping such convalescent quarters well warmed, and additional stoves should be installed if necessary. Warm and conveniently located lavatories are essential. Patients in the acute stage of measles and scarlet fever should use commodes.

8. Enlisted attendants in wards for infectious diseases should wear white cotton coats and trousers, which should be changed twice a week. These garments are on hand in depots, and should be required for at once by the local quartermaster.

9. No nurse or attendant should have charge of two different classes of the above-mentioned infectious diseases. Medical officers in charge of different classes of infectious diseases will carefully disinfect the hands before passing from one class to the other.

10. No blanket or mattress cover used for any of the above-mentioned diseases should be used for another patient until it has been disinfected by steam or chemicals or laundered at a steam laundry. Preferably they should be laundered. The underclothes of patients admitted for the above-mentioned diseases should be disinfected by steam or chemicals at once or laundered, preferably the latter. Outer clothing, except in the case of measles, should be disinfected by formaldehyde in a closed box, and then aired and sunned for three consecutive days.

11. In wards used for the above-mentioned infectious diseases, paper napkins are recommended for receiving nasal secretions. At the head of each bed will be kept a paper bag, fastened to the bed by adhesive plaster. These bags will be used for napkins, gauze, swabs, and other infected refuse, and will be burned when full. Napkins and paper bags may be purchased locally, quoting this memorandum as authority.

12. The above precautions in regard to measles are prescribed primarily to diminish the incidence of the very fatal post-measles pneumonia which has reached alarming proportions in some camps. There has been widespread failure to appreciate the seriousness of measles under existing camp conditions.

13. Immediately on receipt of this memorandum, the commanding officer of a hospital will hold a conference with such of his assistants as are concerned with the handling of infectious diseases, and will arrange for the carrying out of the details as far as local conditions will permit. Report of action taken will be made to this office.

* * * * *

A. E. BRADLEY,

Brigadier General, N. A., Chief Surgeon.

Circular No. 10.

AMERICAN EXPEDITIONARY FORCES,

OFFICE OF THE CHIEF SURGEON,

France, March 4, 1918.

1. *Allowance for soldiers sick in hospital.*—Paragraph 1212, Army Regulations, has been amended so as to provide for commutation of rations for soldiers sick in hospital and members of the Army Nurse Corps at the rate of 60 cents a day at all stations where purchases of subsistence supplies from Quartermaster Department are possible, and at the rate of 75 cents a day at stations where purchases must be made in open market—effective February 16, 1918.

From and including February 16, the claim upon the Red Cross for 35 cents a day for additional rations will be discontinued.

Red Cross allowance for soldiers of the allied armies in American hospitals.—The Red Cross has agreed to continue an allowance for members of the allied armies in American hospitals. Vouchers therefor will be submitted through this office, accompanied by the certificate that these funds have been or will be actually expended in providing additional rations in accordance with the purpose for which the money has been appropriated by the American Red Cross. The amount allowed is 20 cents a day for patients.

2. *Misuse of adhesive tape and surgical bandages.*—It has been reported to this office by a collector of internal revenue in the United States that large numbers of packages are being received from the American Expeditionary Forces secured with adhesive tape and surgical bandages. Such waste of material is reprehensible under present conditions. All commanding officers will immediately take steps to prevent any such misuse of these supplies.

3. *Reports on civilians.*—Hereafter, report called for by General Order No. 13, headquarters, A. E. F., in the case of civilians employed, will be made out on the following form (letter size):

----- 191--

From -----
 To Chief, Intelligence Section, A. E. F.
 Subject: Investigation of employee.

It is requested that ----- whose description follows, be investigated by your office, with a view to ----- employment as ----- at a salary of -----

(Signature) -----

Name and all surnames -----
 Nationality -----
 Place of birth -----
 Date of birth -----
 Address (actual lodging; not business address) -----

 Last employment -----
 Name and nationality of father -----
 Name and nationality of mother -----
 References (3) -----

4. *Use of medical supplies.*—Medical officers are urged to effect every possible economy in medical supplies of all kinds, and to give careful consideration to every requisition, bearing in mind the problems which confront the supply division. Every item should be considered from the standpoint of its relation to the success of our Army and not alone from its convenience and desirability under peace conditions.

The tonnage situation necessitates the utmost economy, and does not permit the furnishing of our hospitals with as elaborate an equipment as would otherwise be possible.

The elimination of all supplies that are not directly beneficial to the health of the soldier or to the success of our Army will permit larger shipments of the essential and vital articles and will help to avoid a possible shortage later.

While price is not yet an important factor, a diversion of labor from the manufacture of essential articles is and such diversion results from the purchase of nonessential articles however desirable they may be. The careful cooperation of all medical officers in this matter of economy will be of very great value. Economy should be practiced both at the time requisitions are made and in the use of the articles when received.

It is not desired that medical officers economize in any way that will interfere with the recovery or comfort of the patients. There is no need therefor. Tonnage for all such essentials for the medical department will be forthcoming.

But the needs of the medical department are only a part of the great needs of our Army, and the fact that the requirements for the sick are given precedence over a great many other supplies should make us insistent that the privilege is not abused. Every item saved will not insure the only future supply of the essential articles, but will aid materially in the success of the Army, whose interests we serve.

5. *Supply of nonperishable subsistence stores.*—Base hospitals are authorized and directed to carry in stock a 15 days' supply of nonperishable subsistence stores based on the maximum strength of patients and personnel. Requisitions will be submitted at such times as to maintain this stock and meet the current needs. Should the hospitals be located in hospital centers where quartermaster depots are established, this stock need not be carried at each hospital if the facilities of the depot are sufficient to maintain that stock for the entire area.

6. *Empty Prest-o-Lite tanks.*—Empty Prest-o-Lite tanks should be sent direct to the purchasing officer, medical department, Paris, for transmission to the Societe des Appareils, Magondeaux, No. 6 Rue Denis-Poissons, Paris, advising him by mail of all shipments and of the number of tanks shipped.

7. *Ordre de transport.*—The following, from Circular No. 9, office of the chief quartermaster, general headquarters, A. E. F., is repeated:

1. The proper disposition of the pink and yellow folds of the ordre de transport does not seem to be clearly understood by many shipping and receiving officers, and, pending issuance of new forms, which are designed especially for use by the American Expeditionary Forces, officers should strictly observe the following instructions in the use of the French forms.

2. When a passenger is given his ordre de transport he should be told to present it to the chef de gare (railroad agent) at point of departure, that the chef de gare will retain the pink fold, but will stamp and return to him the yellow fold, which is his ticket for the trip; that he must preserve and turn over this yellow fold on arriving at destination to his commanding officer.

3. When the commanding officer receives the yellow fold of the ordre de transport from a soldier, or detachment of soldiers, arriving at destination, he will note the number of persons actually transported thereon, if there is a discrepancy, and forward it to the chief quartermaster, A. E. F.

4. When a shipment of freight reaches the point of delivery the receiving officer will take the yellow fold of the ordre de transport (which has been forwarded to him by the shipping officer) and present it to the chef de gare who will deliver the shipment to him. He will carefully check the shipment with the ordre de transport, noting on the reverse side, in the space provided therefor, any shortage or damage, and will see, before signing it, that the chef de gare makes similar notations on the pink fold held by him. The yellow fold, after the necessary notations have been made and signature of the receiving officer affirmed, will be forwarded at once to the chief quartermaster, A. E. F., accounting division.

5. Many copies of the pink fold of the ordre de transport (A-2 and B-2) are being forwarded to this office, which is a mistake. This part of the ordre de transport is property of the carrier, on which the transportation charges are based, and has no place in the records of this office.

6. A careful observation of these rules will greatly facilitate the settlement of transportation accounts with the French Government.

8. *Report of supplies received not properly marked.*—The commanding general, S. O. R., directs all officers receiving shipments not properly marked, as provided in General Order 17, general headquarters, A. E. F., 1918, paragraph 2, subparagraph 4, to make report, in detail to headquarters, S. O. R.

9. *Report on civilians.*—The commanding officer of each Medical Department organization will submit to this office at once a report showing the present status and number of civilian laborers employed, giving location of labor, nature of work at which employed, and terms under which employed, including copy of any written contracts made in connection with same.

10. *Transfer of patients with self-inflicted gunshot wounds.*—In compliance with section D, paragraph 162½, Army Regulations, the report of the board of officers which investigated the case will hereafter invariably accompany the patient upon his transfer, that whether his injury occurred in line of duty may be determined.

A. E. BRADLEY,
Brigadier General, N. A., Chief Surgeon.

Circular No. 11.

HEADQUARTERS, AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON,
France, March 4, 1918.

The following instructions are issued for the guidance of all medical officers:

1. Injuries to the bones and joints, as well as of the muscles and tendons adjacent to these structures, represent a large percentage of the casualties of both the training the combat periods of an army.

2. To restore useful function to these injured structures is one of the purposes of the medical organization of the Army. The problems involved in this have to do not only with the cleansing and healing of the wounds, but also with the restoration of motion in the joint or strength to the part. This latter part naturally follows the first, but it is essential that the first part be carried out with reference to that which is to follow. Unless this second part of the treatment, the restoration of strength and motion, is carried out, much of the first part is purposeless.

3. To insure to the man not only the proper treatment for this type of injury, but the proper supervision until he is as fully restored as possible, necessitates some form of radial control that makes it impossible for a man to be overlooked in inevitable transfers, from service to service, or hospital to hospital.

4. Since so much of the ultimate result in these conditions depends upon orthopedic measures after the first treatment of the wounds has been carried out, the following will govern:

The director of orthopedic surgery is responsible for the treatment of the injuries or diseases of the bones or joints, exclusive of the head and face.

He will be held responsible for the treatment of injuries or diseases of the ligaments, tendons, or muscles that are involved in the joint function of the extremities.

Officers attached to other divisions may operate upon and treat such conditions, but the division of orthopedic surgery, through its director, will be held responsible for the character of the treatment and for the final results.

It is expected that the direction and supervision of the treatment here indicated will be carried out, in so far as is possible, in cooperation with the director of the division of general surgery.

5. To carry out the instructions of this circular, the director of the division of orthopedic surgery will arrange so that representatives of his division will see all cases of the nature described, to determine whether or not their management is proceeding satisfactorily so as to obtain the best possible results. These representatives will report to the commanding officers of the hospitals in which such patients are being treated and their services as consultants will be freely utilized; any recommendation made by them as to change of treatment, transfer to some other professional service, or hospital, will ordinarily, if the military situation permits, receive favorable consideration.

6. It is not the intention of this order to interfere with the routine work of hospitals, but to insure to the soldier proper supervision during the time of his treatment and the period of his convalescence.

By command of General Pershing:

A. E. BRADLEY,
Brigadier General, N. A., Chief Surgeon.

Approved:

J. G. HARBORD, *Chief of Staff.*

Circular No. 12.

AMERICAN EXPEDITIONARY FORCES,
HEADQUARTERS, SERVICES OF SUPPLY,
OFFICE OF THE CHIEF SURGEON,
France, March 6, 1918.

1. Hereafter all requisitions from Medical Department organizations, American Expeditionary Forces, will be made in quadruplicate, one copy being retained and three copies being forwarded directly to the supply depot.

2. Of the three copies received at the depot, one will be retained for file, one will be returned to the organization with marks as set forth below (indicating the action taken on each item), and the other copy will be similarly marked and forwarded to the chief of the division of accounting and finance, Medical Department, headquarters, Services of Supply.

3. The copy returned to the organization will serve both as an invoice and as a packing list, and those two forms heretofore furnished organizations will no longer be prepared. Upon receipt of the marked copy from the depot, the organization making the requisition will erase all articles on the corresponding retained copy except those shown on the copy from the depot as having been shipped (showing the amounts shipped in any article cut) and will then forward the copy so marked to the chief of the division of accounting and finance, Medical Department, headquarters, Services of Supply, direct, acknowledging receipt across its face.

4. The depot copies may indicate certain articles as having been placed upon the due list. Such due lists will be made in triplicate. When shipments are made of these articles previously due listed, one copy of the due list will be sent to the consignee, one copy to the chief of the division of accounting and finance, and one copy retained, all copies being marked as shown in paragraph 5. Upon the receipt of such marked due lists by the consignee, he will change his retained copy of the corresponding requisition to include the articles received,

will sign the due list and forward it to the chief of the division of accounting and finance, Medical Department. When partial shipments are made upon the due lists, the articles not shipped will again be due listed and the same procedure carried out.

5. The marks shown will be as follows:

Check mark (requisition filled in full).

Number replacing the original number (requisition cut to that amount).

Erasure (requisition disapproved).

D. L., followed by number (amount placed on due list; shipment to be made when stock is received).

6. Articles not in stock or not expected within a reasonable time will not be due listed and should therefore be again requisitioned for, but not until the lapse of a sufficient interval to warrant expectation of their receipt from the States. Articles not on hand, but expected within a reasonable time, will be due listed and will be furnished upon receipt without further requisition.

7. Telegraphic requisition will be made in actual emergencies only and must be followed by a requisition made out in proper form in quadruplicate, triplicate copies being forwarded, marked "Confirmation of telegraphic requisition." When requisitions are made in letter form they also will be forwarded in triplicate.

8. In order that the receiving officer may be able to check several shipments arriving at the same time, resulting from two requisitions, or a requisition and a previous due list, the following methods of marking shipments at depots will be established:

All boxes will be marked with the number given the requisition at the depot, followed by the number of packages in the shipment, thus: 25—48 would mean that the shipment was made on requisition No. 25 and that 48 packages were shipped. The copy of the requisition or due list returned by the depot to the consignee would carry the number 25.

9. Attention is again called to the very great importance of conserving medical supplies in every possible way. It must be remembered that supplies are obtainable only with the very greatest difficulty, and every unnecessary expenditure is both hurtful to the country and to the individual soldiers, who by such unnecessary expenditure are deprived of their legitimate due. Frequent inspection of storerooms and the closest scrutiny of all expenditures is enjoined upon all commanding officers and surgeons.

Hospital fund statements.—These statements for the month of April and thereafter, for all organizations of the American Expeditionary Forces in France, will be rendered upon the basis of the amount received, expended, etc., *in francs*—the rate of exchange employed being set forth if conversion from dollars and cents to francs has been necessary. Any loss resultant from this conversion will be shown as an expenditure by expenditure vouchers.

Typewriter repair.—Hereafter all typewriters requiring repair will be shipped to the Medical Department repair shop No. 1, 11ter Ave. de la Revolte, Neuilly, Department of Seine.

A. E. BRADLEY,
Brigadier General, Chief Surgeon.

Circular No. 13.

GENERAL HEADQUARTERS, AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON,
France, March 11, 1918.

1. A daily report of all new cases or suspected cases of any one of the diseases named below will be made from all hospitals by telegraph, telephone, or messenger to this office:

Chicken pox.	Plague.
Cholera, Asiatic.	Scarlet fever.
Diphtheria.	Smallpox.
Dysentery.	Typhoid fever.
Meningitis (meningococcus).	Typhus fever.
Paratyphoid fever.	

2. The report will include name and organization of the patient and the diagnosis.

A. E. BRADLEY,
Brigadier General, N. A., Chief Surgeon.

Circular No. 14.

FRANCE, *March 13, 1918.*

1. In view of the great importance of scabies as a cause of prolonged disability unless prompt diagnosis is made and early treatment instituted, each division surgeon is directed to select a suitable field hospital to which all cases of scabies of the division will be sent.

2. A medical officer of the division, with an adequate knowledge of dermatology, should be used to instruct regimental medical officers in early diagnosis and treatment of this disease if necessary.

3. The urgent necessity of close inspection frequently repeated for skin parasites of all kinds is in this connection again brought to the attention of all medical officers.

Office circular No. 15.

OFFICE OF THE CHIEF SURGEON,
AMERICAN EXPEDITIONARY FORCES,
HEADQUARTERS, SERVICES OF SUPPLY,
France, March 25, 1918.

OFFICE REGULATIONS, CORRESPONDENCE PRACTICE, ETC.

1. The office hours will be 8 a. m. to 12; 1.30 p. m. to 5.30 p. m.

2. Orderlies will regularly distribute the incoming mail to the several offices and collect the outgoing mail. The regular distributing and collecting system will be placed on an hourly basis. Within a few days a buzz system communicating with the orderlies will be installed.

3. Incoming and outgoing baskets (so labeled) will be maintained in each office.

4. Central correspondence files will be maintained in room No. 1. Consolidation of the American Expeditionary Forces and Services of Supply files is under way, as a result of which a single system of numbering will be provided.

5. A central mailing section (receiving and dispatching) will be maintained in room No. 6. Both incoming and outgoing mail will be cleared through the office of Major Dickson.

When action takes the form of an indorsement to original papers which leave the office, necessary copies of the indorsement for file purposes will be prepared. In addition, the office making the indorsement will prepare an abstract of the original papers wherever the indorsement does not fully explain the nature and basis of the action taken. This abstract will be detached in the file room. Such abstracts should be very brief and prepared only for important papers.

7. Half sheets should be used for correspondence or memorandum purposes whenever possible; but nothing smaller than half sheets. The use of smaller pieces of paper causes confusion in the filing.

8. Telegrams will proceed through the regular correspondence channels of the office except that an identifying number will be assigned and a brief record made in the mail room as prescribed by Services of Supply circular.

9. The typing of envelopes in the office where correspondence originates will be discontinued beginning Thursday morning, March 28, 1918. Envelopes will be addressed in the central mailing room, where an official list of stations and addresses will be kept. As prescribed by regulations, each communication will contain the official address of the station to which it is sent.

10. A central stenographic section will be maintained (rooms 20 and 21). Any officer desiring additional stenographic service will make informal request upon the clerk in charge of this section. This section will furnish the mimeograph and multigraph service for the chief surgeon's office.

11. Cablegrams to the United States will be dictated direct to the official cable clerk. This clerk can be reached at any time in room No. 20.

12. Office supplies will be issued from the property room between the hours 8 a. m. and 10 a. m. each day. An issuing clerk will be on duty during those hours. The orderlies

will replenish the supply of ink in the several offices as the need arises. Informal requests, verbally or in writing, for other office supplies should be made upon the issuing clerk during the hours mentioned.

13. Commander in chief, G-1, to commanding general, First Corps, under date of March 22, 1918, states:

It has been decided to designate the senior staff officer of each division as "division adjutant," "division inspector," "division ordnance officer," "division signal officer," "division veterinarian," instead of "inspector general," "judge advocate," "chief quartermaster," "chief surgeon," "chief ordnance officer."

The title "division surgeon" will be used instead of "chief surgeon" in all official designations of the senior medical officer of Infantry divisions.

A. E. BRADLEY,
Brigadier General, N. A., Chief Surgeon.

Circular No. 16.

AMERICAN EXPEDITIONARY FORCES,
HEADQUARTERS, SERVICES OF SUPPLY,
OFFICE OF THE CHIEF SURGEON,
France, March 28, 1918.

I

The following extract from a letter, Surgeon General's office, dated February 25, 1918, is published for the information and guidance of medical officers of the American Expeditionary Forces:

1. * * * It is requested that whatever steps are necessary be taken to carry out the plans laid down in the Manual of the Medical Department, which provide that pathological specimens of military interest be forwarded through regular channels to the Army Medical Museum accompanied by complete histories.

2. In turn, the Army Medical Museum will distribute all duplicate specimens and parts of specimens, together with the clinical histories, to teaching institutions throughout the United States, both in and out of the service. Since all medical students above those in the first year are now in the Enlisted Men's Reserve Corps, every teaching medical institution becomes for all practical purposes a part of the service, and it is desirable to secure an equitable distribution of material for teaching purposes.

II

To Medical Department personnel: 1. The Assistant Auditor for the War Department has stated that he sees no objection to quartermasters paying civilian employees of the Medical Department from quartermaster funds, provided the civilian employees payable from Medical Department funds are vouchered on separate rolls, and the Medical Department appropriation to which chargeable is clearly shown thereon, and that such rolls are entered on the abstract of disbursements under the same medical appropriation as is shown on the voucher. Under this decision, it is possible for quartermasters at all base hospitals to make the necessary payments to all civilian employees of the Medical Department on the approval of the pay roll by the commanding officer of the hospital, which action the commanding officer is authorized to take.

Another method of ready payment to civilian employees of the Medical Department lies in making the payment from the hospital fund, if there be enough on hand. A notation to the effect that the payment was made from the hospital fund should be made upon the voucher by the paying officer, and the voucher subsequently forwarded to medical disbursing officer, who will draw one check for the whole amount payable to the hospital fund, noting on the check the object for which drawn and on the pay voucher the number and other data of the check.

2. Recent arrangements with the French central authority provide that notifications of property shortages occurring in official shipments should be made immediately upon the discovery of the shortage of the local chef de gare of the railroad company concerned. It is, of course, necessary that immediate action should be taken upon the receipt of a shipment

to determine whether shortages are existant, in order that no allegation may be lodged that the property was received in good condition, and the abstractions subsequently made at the point of receipt. The fact that the report has been made to the chef de gare should be reported to the chief surgeon, American Expeditionary Forces, along with the report of shortages.

3. *Commutation for allied patients in hospital.*—The commutation for patients of this class has now been determined to be 60 cents a day, where commissary privileges are available and 75 cents a day, where such is not the case. Under these conditions, it will not be necessary to draw the additional 20 cents from the Red Cross, as heretofore authorized. This change becomes effective from April 1, 1918, and after that date the 60 cents allowed will be drawn as the entire compensation to the hospital fund for both officer and soldier patients of the allied armies.

III

1. The attention of all medical officers commanding hospitals and Medical Department detachments is called to the importance of carrying out closely all the details of military administration required by existing regulations, orders, and customs of the service, to the end that their commands may at all times be ready to pass with credit the inspection of superior officers.

2. Cases of neglect or slackness in carrying out ordinary measures of discipline, administration, and sanitation having been brought to the notice of the chief surgeon special emphasis is here given to the following points: Discipline and administration—the reveille and check roll calls are to be invariably observed in every hospital and detachment; the weekly formation and inspection of the detachment must never be omitted and military drill for all available men of the Medical Department will be held as often and to as great an extent as circumstances permit, with the object that every soldier may present a well-poised, alert, and soldierly appearance.

A correct military bearing of officers, nurses, and soldiers must be insisted upon and the personnel should be instructed in forms of military address, manner of saluting, standing at attention, and all the fine points of military etiquette. Correct uniform properly worn and neatness of person and clothing should be required of all members of the command.

3. *Sanitation.*—Details of sanitation for the maintenance of a clean hospital are only to be carried out properly by frequent and patient instruction to subordinates, by officers and noncommissioned officers responsible for the care of the wards, mess rooms, kitchens, and other parts of the hospital.

Attention to the personal cleanliness of the convalescent patients as well as those in bed should be given.

Garbage unless entirely removed from vicinity of the hospital should be destroyed by incineration, and excreta, in the absence of a sewer system, should be burned if possible.

Cleanliness and order will render even a primitive and extemporized hospital attractive, but slovenliness and disorder will spoil the efficiency of the best-equipped institution. To utilize to the utmost advantage the often imperfect buildings and equipment which war conditions impose, is the ideal to be striven for and this ideal is only to be approached by unremitting attention to the small details of discipline, management, and sanitation.

A. E. BRADLEY,
Brigadier General, N. A., Chief Surgeon.

Circular No. 17.

AMERICAN EXPEDITIONARY FORCES,
HEADQUARTERS, SERVICES OF SUPPLY,
OFFICE OF THE CHIEF SURGEON,
France, April 2, 1918.

INSTRUCTION CONCERNING AUTOPSIES

In order to secure proper records of causes of death of American troops in France, and specimens of scientific value for the Army Medical Museum, the following procedures concerning autopsies will be followed:

1. Autopsies are authorized in all cases of officers and soldiers, and should be performed whenever possible. These autopsies shall be performed only by medical officers or authorized assistants. At the conclusion of the autopsy the body must be restored, as far as possible, to its original form.

2. The blank form supplied for the autopsy protocol indicates in general the order and extent of the examination as well as the order to be observed in completing the final record. The protocol is also to be used for recording preliminary notes when complete dictation at the post-mortem is not possible. It is not to be used for the final record.

3. The headings on the protocol are to be filled out in every case and transferred in the same order to the final record.

4. Clinical data should include only such essential facts as date and nature of wound or first symptoms, length of stay in hospital, operative procedures, clinical course and diagnosis.

5. Weights and measurements should be indicated by the metric system.

6. In performing the post-mortem attention should be directed when possible, not only to the condition primarily responsible for death but also to evidence of previous disease (tuberculosis, syphilis, etc.) and to all anomalies of development.

7. Bacteriological examinations, when indicated, should be undertaken and the results appended to the final record.

8. When necessary to perfect the diagnosis, tissues for microscopic examination should be removed and preserved in 10 per cent formal or other suitable fixative.

9. Gross specimens suitable for museum purposes are to be removed and preserved in 10 per cent formal. Such specimens are to be sent to the central Medical Department laboratory, A. E. F., as soon as possible, for eventual transference to the Army Medical Museum. Each specimen must have attached an identification tag with name and organization of patient, date, diagnosis of specimen, and name of sender. In case special tags for this purpose are not available, an ordinary label protected by dipping in melted paraffin may be used. For further details as to handling gross specimens, see supplement to section 135, Manual of the Medical Department.

10. At the earliest possible moment following the examination, a complete record should be made. In addition to the required copies, one copy is to be sent to the central Medical Department laboratory, A. E. F. If additional bacteriologic, microscopic, or other data are obtained, additional reports will be made in the same manner, in each report repeating the name, rank, and organization of the case.

A. E. BRADLEY,
Brigadier General, Chief Surgeon.

Circular No. 18.

AMERICAN EXPEDITIONARY FORCES,
HEADQUARTERS, SERVICES OF SUPPLY,
OFFICE OF THE CHIEF SURGEON,
France, April 3, 1918.

1. In order that patients and Medical Department personnel in mobile sanitary formation and evacuations hospitals located in the zone of the advance may be prepared for gas defense in emergencies, the following instructions are issued to responsible medical officers concerned:

(a) The gas mask of each incoming patient should be separated from his other equipment, and kept at the head of his bed.

(b) To supply such patients as are admitted without proper gas defense equipment, requisitions should be made on the proper officers for a reserve supply of masks, based on 20 per cent of the maximum bed capacity.

(c) The personnel of these units should be equipped with masks and instructed in the necessary routine gas defense measures.

(d) The commanding officer of each unit should so organize and drill the personnel as to insure the quick adjustment of gas masks to patients, especially to those patients who are more or less helpless, in the event of an alarm being given.

(e) The plan to be prescribed for announcing the gas alarms is left to be determined by the commanding officer concerned.

(f) Paragraph 3, General Orders, No. 25, A. E. F., chief surgeon, prescribes that all military equipment of a soldier be forwarded with him when he is transferred to a hospital. This equipment includes gas masks. Should patients be received at hospitals in appreciable numbers without this equipment, report of same, particularly giving the soldier's organization, will be made to this office for the action of the commander in chief.

A. E. BRADLEY,
Brigadier General, Chief Surgeon.

Circular No. 19.

AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON, SERVICES OF SUPPLY,
France, April 4, 1918.

1. *Accountable office for Medical Department transportation.*—There seems to be some misunderstanding by organizations in the different sections regarding the accountable office for Medical Department transportation in France.

M. S. D. No. 3 is the only accountable office for Medical Department motor transportation.

Motor ambulances and motor cycles with and without side car are Medical Department transportation; touring cars and trucks are Quartermaster Department property, and memorandum receipts for the latter should not be sent to M. S. D. No. 3.

2. *Charging excess leave against nurses under General Order No. 6.*—The commanding officers of base hospitals where nurses are stationed will take care that no excess leave is charged against nurses who are granted leave under General Order No. 6, general headquarters, A. E. F., c. s. Several instances have occurred where nurses have been charged on efficiency reports and returns of Nurse Corps with the time taken going to and returning from the places where leave was spent. Attention is invited to the provisions of paragraph 7, General Order No. 6.

3. *Shoes for distribution to Medical Department personnel.*—The quartermaster has in storage a certain number of shoes without hobnails, for distribution to Medical Department personnel serving in base and camp hospitals. Requisition therefor should be made asking specifically for special shoes for base hospitals.

4. *Care of unwounded cases of gas poisoning.*—The dangerous results of poisoning by irritant gases are essentially limited to their effects on the respiratory tracts, and all such cases should be under careful medical supervision in view of the danger of pulmonary edema and pneumonia. It is directed therefore that all unwounded cases of gas poisoning be placed in the medical wards of the hospitals to which they are admitted. Such burns as occur from mustard gas poisoning may be readily treated in medical wards.

A. E. BRADLEY,
Brigadier General, N. A., Chief Surgeon.

Circular No. 20.

AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON, SERVICES OF SUPPLY,
France, April 12, 1918.

1. *White clothing for hospital attendants.*—So much of paragraph 8, Circular No. 9, office chief surgeon, A. E. F., February 7, 1918, as provides for the wearing of white cotton coats and trousers by enlisted attendants in wards is changed to provide for the wearing of blue dungarees under the conditions named. Requisitions on the Quartermaster Department for clothing to be worn on ward duty will specify the blue dungaree, instead of white clothing. The Quartermaster Corps has made provision for the supply of white clothing for cooks; and requisitions may specify this class of clothing for this class of personnel.

2. *Red Cross allowance for soldiers of allied armies in United States hospitals.*—So much of paragraph 1, Circular 10, office chief surgeon, A. E. F., March 4, 1918, as provides for the

payment of 20 cents per diem by the Red Cross is rescinded. Quartermasters are paying 60 cents per diem for subsistence of allied patients, or 75 cents as the situation may demand, dependent upon the presence or absence of commissary facilities. No voucher for Red Cross subsistence, therefore, will be rendered in the future, the cost of allied patients being collected from the quartermaster in the same way that it is collected for patients of our own Army.

3. *Manual, sick and wounded reports.*—A manual dealing with the sick and wounded reports and returns for the American Expeditionary Forces, and with the methods of preparing the same, will be issued shortly from the office of the chief surgeon, A. E. F., Services of Supply.

It is desired that every medical officer of the American Expeditionary Forces and all medical officers arriving hereafter in France and England be furnished a copy of this manual.

Copies will be sent to division surgeons, section surgeons, and commanding officers of camp, evacuation, and base hospitals, who will immediately distribute them to each officer of their command.

Sufficient copies to supply all incoming medical officers will be sent to surgeons of ports of debarkation, who will be responsible for their distribution.

Instructions for obtaining the blank forms prescribed for the new system will be issued later.

4. *Splint repair shop at Dijon.*—The Red Cross has installed a splint repair shop at Dijon for the purpose of repairing the ironwork of splints and re-covering the splints.

All organizations having broken splints in sufficient quantities to make a case will ship to the Croix Rouge Americaine entrepôt, gare Dijon Ville (Cote d'Or), cases to be plainly marked "For splint repair shop."

A. E. BRADLEY,
Brigadier General, N. A., Chief Surgeon.

Circular No. 21.

APRIL 13, 1918.

SUPPLY AND DISTRIBUTION OF BIOLOGICAL PRODUCTS (HUMAN)

1. The following standard biological products are available for issue to Medical Department units of the American Expeditionary Forces:

(a) *Bacterial vaccines.*—Triple typhoid vaccine—typhoid, para "A," and para "B" (1 c. c., 5 c. c., 10 c. c., and 25 c. c. ampules).

(b) *Serological products.*—(1) Sera, agglutinating for diagnosis:

Typhoid.	Pneumococcus Type I.
Paratyphoid A.	Pneumococcus Type II.
Paratyphoid B.	Pneumococcus Type III.
Dysentery, Flexner.	Meningococcus, polyvalent.
Dysentery, Shiga.	Meningococcus, normal.
Dysentery, Y.	Meningococcus, intermediate A.
Cholera.	Meningococcus, intermediate B.
Malta fever.	Parameningococcus.
Gas gangrene (<i>B. welchi</i>).	

The diphtheria toxin unit for applying the Schick test will be issued to meet special indications.

(2) Sera, therapeutic and prophylactic:

- Antimeningococcus serum, polyvalent (15 c. c. bottles).
- Antistreptococcus serum (50 and 100 c. c. bottles).
- Antipneumococcus serum, polyvalent (50 and 100 c. c. bottles).
- Antipneumococcus serum, Type I (50 and 100 c. c. bottles).
- Diphtheria antitoxin (bottles containing 1,000 and 10,000 units).
- Tetanus antitoxin (bottles containing 1,000, 1,500, 3,000, and 5,000 units).
- Normal horse serum.

2. In view of the well-known instability of these products unless kept under very special conditions, to avoid wastage, and to insure prompt distribution, reserve supplies of

these products will be kept on hand only at the laboratories mentioned below. It is not contemplated that a supply greater than a reasonable amount to meet actual emergencies be kept on hand in other Medical Department units.

Central medical department laboratory, advance section, Services of Supply, A. P. O. No. 721.

Army laboratory No. 1, advance section, Services of Supply, A. P. O. No. 731.

Base laboratory, base section No. 1, headquarters base section No. 1, Services of Supply, A. P. O. No. 701.

Base laboratory, base section No. 2 (Base Hospital No. 6), headquarters base section No. 2, Services of Supply, A. P. O. No. 705.

Base laboratory, base section No. 5, headquarters base section No. 5, Services of Supply, A. P. O. No. 716.

Base laboratory, intermediate section, Services of Supply, headquarters Services of Supply, A. P. O. No. 717.

Laboratory, American Red Cross Military Hospital No. 2, Services of Supply, A. P. O. No. 702.

3. Hereafter, biological products will be obtained from the commanding officer of the nearest designated distributing center by telephonic or telegraphic request. In emergency, deliveries will be made by motor-cycle courier whenever necessary and feasible. In instances where travel by train would be in the interest of economy and would not result in delay in delivery, the commanding officers of the laboratories designated above are authorized to dispatch couriers by train to make the deliveries.

4. The designated distributing centers are so located that deliveries, as a rule, can be made to any Medical Department unit of the American Expeditionary Forces within a few hours. The geographical location of these laboratories can be ascertained by application to the headquarters in which the medical unit is located.

5. It is not deemed advisable to furnish therapeutic antipneumococcus serum except to hospitals that are prepared to make pneumococcus type determinations. Whenever the disease assumes epidemic proportions, special laboratory personnel and equipment will be detailed to handle the situation.

6. Requests for special biological products will be made directly to the director of laboratories, A. E. F., A. P. O. No. 721, indicating the necessity for their use. The director of laboratories and the commanding officers of laboratories designated as distributing centers are authorized to modify requisitions whenever the demands are manifestly in excess of actual requirements or when the biological products requisitioned for are of such a nature as to require careful laboratory control in their administration and it is definitely known that such laboratory facilities are not available.

7. Additional distributing centers will be designated as necessity for their establishment arises.

A. E. BRADLEY,
Brigadier General, N. A., Chief Surgeon.

Circular No. 22.

AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON, SERVICES OF SUPPLY,
France, April 17, 1918.

1. The attention of all medical officers is again called to the extreme importance of bodily cleanliness and freedom from vermin throughout the troops of the American Expeditionary Forces. The following notes are furnished for the information and guidance of all concerned:

Scabies and lousiness, with their resulting inflammations and scratch infections of the skin; also trench fever, due to lice, bid fair to cause more ineffectiveness than any other disease or disease group in the American Expeditionary Forces.

The experience of the British is well summarized in the lectures of Major McNee and Captain Parkinson:

Trench fever, scabies, inflammatory processes in the skin such as boils and furuncles (the pyodermias), etc., caused 90 per cent of all diseases in the British armies in France in the summer of 1917. (Major McNee.)

At the head of the diseases which actually cause loss of efficiency is scabies, and its frequent sequelæ, impetigo, and ecthyma. Impetigo means a loss of 10 to 12 days at the base, and scabies means a loss of 50 per cent of a man's efficiency from loss of sleep by itching and scratching. Nearly all cases of fever of unknown origin (F. U. O.) are accompanied by lice. This F. U. O. is a serious cause of sick wastage among the English. (Captain Parkinson.)

Sanitary reports from our own divisions, and from numerous scattered organizations in France, indicate that infestation with lice and scabies is widespread, in some large commands as many as 75 per cent of the men being infested.

The steady and heavy demand at dispensaries and regimental infirmaries for ointment to relieve itching indicates that there is a great mass of infestation which is not recorded on sick report.

Sanitary reports should show the incidence of scabies and the extent of the louse infestation. The causes of infestation should be indicated and measures necessary to correct the condition recommended. The remedial action taken must be invariably recorded.

Advantage should be taken of the opportunity to inspect the person and clothing of the command at the semimonthly inspection for venereal diseases, as specified in M. M. D. 1917 (par. 198-c, p. 75). General bodily cleanliness and cleanliness of underclothing are quite as much an evidence of good military discipline and adequate medical service as is a low rate for venereal infection.

* * * * *

HINTS FOR DIAGNOSIS AND TREATMENT

All scratch marks, complaints, or evidence of itching, or "pyodermias" should be considered as due to scabies or lice until proved to the contrary.

Although in civil life the characteristic distribution of scabies is between the fingers and on the anterior surface of the wrists, the site of infestation among our troops, even when severe, may be exclusively beneath the clothing, and must be sought by thorough inspection of the genitals, the buttocks, the belt line, the arm pits, and behind the knees.

The characteristics lesions of scabies, in addition to the burrow in the skin, are papules, superficial crusted ulcerations (often called impetigo and ecthyma), and in severe cases extensive areas of dermatitis resembling eczema and furunculosis. These secondary lesions may predominate and conceal all burrows. The *Acarus scabiei*, or itch mite, can not usually be found. The scratching in scabies usually does not tear the skin deeply nor form linear welts, in spite of the intensity of the itching.

Body lice, on the contrary, are more generally distributed over the body and are to be found commonly on the hairy parts and in the body creases and where the clothing is tight, and it is in these regions that the long deep linear scratches are found. Lice and nits are to be sought for and can be readily seen in the seams of the clothing.

Prevention of general infestation of men and their clothing can be assured by the discovery of early cases, through careful inspection and accurate diagnosis, and the instant removal of the patients and their possessions from barracks or billets, to avoid the general infestation of quarters. All men should be questioned as to itching of the skin, and no complaint considered too trivial to investigate.

The treatment of scabies requires prolonged scrubbing of the entire body with hot water and a generous soap lather, followed by thorough inunction with sulphur ointment. Clean underclothing must be put on after each such treatment to avoid reinfestation.

A complicating eczema or furunculosis may prevent the above radical treatment of scabies until the secondary lesions are controlled, but then the scabies must be treated as above.

Thorough hot water and soap bathing will free the body from lice, but the lice and nits in the clothing and blankets must be destroyed, preferably by dry heat, at the same time in order to prevent immediate reinfestation.

Every medical officer in the American Expeditionary Forces will be expected to give his personal attention to the prevention and treatment of scabies and louse infestation in the command for which he is responsible.

A. E. BRADLEY,
Brigadier General, N. A., Chief Surgeon.

Circular No. 23.

FRANCE, April 22, 1918.

1. *Payment of civilian employees by quartermaster.*—Whenever payment of civilian employees is made by the quartermaster under the method laid down in paragraph 1, section 2, Circular No. 16, this office, a true copy of the roll as paid will be sent to this office, through the section surgeon, by the commanding officer of the hospital concerned.

2. *Repair of surgical instruments and typewriters.*—The surgical instrument repair shop is now ready to repair surgical instruments and typewriters at U. S. A. P. O. No. 702. When articles need repair they should be sent to the repair shop or turned into the nearest supply depot, dependent upon the relative distance of the depot and repair shop from the point where the instruments or typewriters are held. It will often be advisable to send instruments of precision and of delicate makeup by special messengers, and authority should be obtained for their transportation from the nearest headquarters authorized to order the travel.

3. *Ordre de transport for movements made by hospital trains.*—Copies of those orders which are furnished to train commanders for each trip made by their trains should be retained until the end of the month, at which time they should be forwarded to this office, where they are checked against the journey reports and forwarded to the chief quartermaster, Services of Supply.

4. *Return of blankets to hospital trains.*—Hospital trains have been unnecessarily delayed at base hospital awaiting the return of blankets delivered by them with patients. These blankets are to be returned with expedition in order to avoid delaying the trains.

5. *Report of French patients in American military hospitals.*—Hereafter when French military patients are admitted to or discharged from American military hospitals, notification of the fact will be sent immediately to the Service de Sante, No. 1, Rue Lacreteille, Paris, on Form 52, Medical Department. The data on the report card will show the name, number, rank, and organization of the patient, the diagnosis, whether or not the disability was incurred in line of duty, and the designation of the hospital to which he was admitted or from which discharged. Information in this form is strictly for the use of the French, and no duplicates of these cards shall be sent to the chief surgeon's office, A. E. F. The monthly list of French patients in American Expeditionary Forces hospitals, giving the above data, will be continued.

6. *Discontinued medical forms.*—Forms 83 and 85, Medical Department, and so much of Form 84, Medical Department, as applies to daily field report of patients, are discontinued.

Circular No. 24.

AMERICAN EXPEDITIONARY FORCES,

France, April 23, 1918.

Disability boards passing upon mental and nervous cases under section I, General Order No. 41, general headquarters, A. E. F., March 14, 1918, will, as far as practicable, be governed by the following considerations.

GENERAL

In dealing with these cases, there should be borne in mind their chronicity, the probability of recurrences or acute episodes in constitutional disorders, and the bearing which abnormal mental states have upon questions of responsibility. The special mental stresses of modern warfare and the fact that the safety of many soldiers often depends upon the conduct of one of their number should be given due weight in considering the fitness of men with mental or nervous diseases for service at the front. At the same time the importance of utilizing, in any safe and suitable way, the services of men partially incapacitated should not be overlooked. The essential question for boards to decide is usually whether, taking all the facts into consideration, the individual before them will be an asset or a liability to the Expeditionary Forces. Whenever possible a psychiatrist or a neurologist should act as one member of a board passing upon mental cases.

PSYCHOSES (INSANITY, MENTAL ALIENATION, MENTAL DISEASES)

All officers and enlisted men in whom frank psychoses exist should be marked "D" and returned to the United States as soon as this can be done without injury or endangering their chances of recovery. It will often be advantageous to hold these cases in the psychiatric departments of base hospitals at base ports until acute and severe manifestations have passed or, in cases of an especially favorable type, until recovery has taken place, but it should not be made the practice to provide extended treatment in hospitals of the American Expeditionary Forces.

In exceptional cases where it seems desirable to depart from the rule of returning to the United States soldiers who have or who have had psychoses, the patients may be classified "B," and the special considerations which make a departure from the rule desirable must be noted on the report card.

MENTAL DEFICIENCY (FEEBLE-MINDEDNESS, DEFECTIVE MENTAL DEVELOPMENT)

The existence of a readily demonstrable degree of mental deficiency should almost invariably be sufficient reason for not classifying soldiers as "A," but it should by no means be regarded as sufficient reason in itself for placing them in class "D." In recommending mentally defective soldiers for duty in labor organization at the rear, especial weight should be given to good physique, emotional stability, and freedom from such delinquent traits as alcoholism, dishonesty, nomadism, and the like. Military delinquents, of whom the mentally defective constitute a large proportion, are a source of almost as much noneffectiveness as illness, and it is important that the Expeditionary Forces should not be burdened with their care and supervision. Defective delinquents should always be classified "D."

CONSTITUTIONAL PSYCHOPATHIC STATES

In making recommendations as to the disposition of soldiers found to have constitutional psychopathic states, the considerations mentioned under the preceding heading should govern. It should be remembered that many individuals with volitional defects are amenable to military control. Conditions which should usually indicate the wisdom of returning these cases to the United States are marked emotional instability, sexual psychopathies (homo-sexuality, etc.), paranoid trends, and specific criminalistic traits. These cases should be classed "D." Excessive fear or timorousness should prevent return to duty at the front. For military reasons it is especially undesirable, however, to return such cases to the United States. They should be recommended for duty in labor organizations and marked "C."

EPILEPSY

Epileptics should be classed as "D," the only possible exceptions to this rule being individuals in robust physical health who have attacks of moderate severity at long intervals and those in whom treatment has had this result.

In making the diagnosis of epilepsy the fact should be borne in mind that attacks are likely to be less frequent in the favorable environment of the hospital while observation is being carried on than in the organizations from which patients are received. Great weight should be given to a well-authenticated history of epileptic seizures, especially when witnessed by medical officers or other persons who can give a clear account of their character. While the possibility of malingering should not be overlooked, it should be remembered that attacks similar to those in epilepsy are much more frequently psychoneurotic in their nature than feigned. The high prevalence of epilepsy among soldiers should be remembered.

DRUG ADDICTION AND ALCOHOLISM

These conditions are essentially curable. Inebriates and drug addicts should not be recommended for return to the United States with a view to their discharge until they have failed to respond to adequate treatment. Then, their disposition should depend upon the type of personality presented, the effects of alcohol or drugs in physical deterioration or damage to the central nervous system, and the conditions to which they will be exposed when they are returned to duty. It will often be found that these cases do better at the front than in duty at the rear.

PSYCHONEUROSES (HYSTERIA, NEURASTHENIA, PSYCHASTHENIA)

These conditions must be dealt with as disorders amenable to treatment under proper conditions. Individuals who fail to benefit from such treatment in the special hospital which has been provided, either because of severe defects in make-up or on account of previous mismanagement, should be returned to the United States for continued treatment unless it seems likely that good results can be obtained from their assignment to duty at the rear. A very large proportion of the severe neuroses seen in war are of the "situation type," rather than psychoneurotic manifestations in persons who have had many previous episodes of the same kind in civil life.

A. E. BRADLEY,
Brigadier General, N. A., Chief Surgeon.

Circular No. 25.

AMERICAN EXPEDITIONARY FORCES,
France, May 5, 1918.

ORGANIZATION OF PROFESSIONAL SERVICES, MEDICAL DEPARTMENT, A. E. F.

There has been appointed, by General Order No. 88, general headquarters, A. E. F. June 6, 1918, for the Medical Department:

- A director of professional services, A. E. F.;
- A chief consultant, surgical service, A. E. F.;
- A chief consultant, medical service, A. E. F.;
- Senior consultants in special subdivisions of surgery and medicine;
- Division specialists; and
- Consultants for base hospital centers and other formations.

In order to utilize the professional services of the specialists of the Medical Department, A. E. F., in a manner which will best facilitate complete coordination between forces from front to rear, the following instructions are issued:

Director of professional services.—The director of professional services, under the hospitalization division of the office of the chief surgeon, will supervise the professional activities of the Medical Department, A. E. F., and coordinate the work of the consultants and specialists of the Medical Department.

Chief consultants.—The chief consultant, surgical service, will supervise the professional surgical subdivisions in the American Expeditionary Forces. He will organize and coordinate these divisions in a manner which will permit him to anticipate, as far as possible, necessary changes in personnel so that timely requests for such changes may be made. He is responsible for the proper formations of the surgical teams in the American Expeditionary Forces, and those attached to the units of the Allies, and he will keep lists and records of the teams whereby the amount and the efficiency of their work may be checked. For this purpose he will require from each surgical team suitable monthly reports of the number of operations performed and the results obtained. He will make such recommendations as he may deem necessary for inspections as to technical procedure and instruction, details of operating surgeons, details to surgical teams, and appointment of surgical consultants in the American Expeditionary Forces.

The chief consultant, medical service, will supervise all medical subdivisions in the American Expeditionary Forces, and will make such recommendations as may be necessary to insure a high professional standard and complete harmony among his assistants functioning in all formations.

Senior consultants.—Under supervision of the director of professional services and the chief consultants in surgery and in medicine, senior consultants of the special subdivisions of medicine and surgery will coordinate professional activities relating to their specialties.

They will make such recommendations to the chief consultant as are deemed necessary for the instruction of consultants and specialists in divisional and other army formations, in order that prompt execution of directions relative to professional subjects may be assured.

Senior division consultants.—One senior medical and one senior surgical consultant will be assigned to all tactical organizations which are the equivalent of one army corps, and

consultants will be appointed in such numbers as may be necessary to assist the senior division consultants. Senior division consultants will hereafter be responsible for the duties now being performed by the division consultants.

The senior division surgical consultant, under the chief surgical consultant, A. E. F., will be expected to make at frequent intervals a complete survey of the professional instruction, surgical technique, and the methods of treatment in use in the division, and he will render from time to time such reports and recommendations to the chief surgical consultant, A. E. F., as will promote a free interchange of suggestions and the most effective coordination with the other professional services.

He will supervise the professional activities of all consultants, operating teams, and operating surgeons attached to his division, in a manner which will permit him to familiarize himself with the individual capabilities of the men, with a view to selection, based on observation, of those likely to adapt themselves to modern military surgical teams formations, rather than individual work.

He will be responsible for the organization, efficiency and distribution of surgical teams, and he will make such recommendations to the chief surgical consultant, A. E. F., as will facilitate the formation of sufficient teams to meet the constantly increasing demands incident to the arrival in France of new formations.

The senior divisional consultant will also coordinate the activities of the professional personnel in his divisions in a manner that will be conducive to high surgical standards, and elimination or reassignment to other duties of those who fall below the requirements. He will spare no effort to promote professional harmony and unity of treatment in the divisional formations.

Senior divisional medical consultants.—The senior divisional medical consultant will, by frequent inspections, satisfy himself that the various classes of patients suffering from medical disabilities are receiving the best and most advanced treatment possible. He will report from time to time to the chief medical consultant, A. E. F., the results of his inspections, and make suggestions looking toward the perfection of the medical services of the American Expeditionary Forces.

Divisional surgical consultants.—The divisional surgical consultant will, under the senior divisional surgical consultant, supervise the immediate surgical activities of operating teams within his division. During mobile or semimobile warfare, when established evacuation hospitals are absent, the operative work, in formations for nontransportable cases, will be handled, when practicable, by surgical teams functioning under the supervision of the senior divisional surgical consultant, or his assistant.

Divisional medical consultants.—Divisional medical consultants will supervise the immediate medical activities in the division to which they may be assigned.

Relation of the division surgeon to senior division surgical consultants and consultants functioning with divisions.—The many details of organization and administration which will devolve upon the division surgeon, in the care of sick and wounded and their evacuation, will so tax his time and ability that it is not believed that the supervision of the technical surgical work, which at times must be done in divisional formations, should be added to his already serious responsibilities; therefore, the direction and supervision of the purely operative side of the work done in divisional formations is placed upon the senior divisional surgical consultant, or his assistants.

The division surgeon will supply the necessary hospital facilities, supplies, and personnel other than those forming teams. He will spare no effort in technical cooperation which may promote harmony of action between the professional services with the fighting forces, from the front to the rear.

Division specialists.—One orthopedic surgeon, one urologist, and one neuropsychiatrist will be appointed from the division sanitary personnel, and, under the direction of the divisional chief surgeon, they will perform the duties pertaining to their several specialties, in addition to the other duties of medical officers which may be required of them by the exigencies of the service.

Consultants for base hospital centers.—Upon the recommendation of the chief surgical and medical consultants, A. E. F., there will be appointed for base hospital groups such consultants as may be necessary from time to time. These consultants will at all times be within reach of the base hospital group to which they are attached.

The organization of base and general hospitals and other hospitals, as far as practicable will be made on the basis of three services—surgical, medical, and laboratory—each composed of sections coordinated through a chief of service designated by the commanding officer, who may be selected from any section, ability and experience being the determining factors. In detail, the professional services of hospitals are divided according to the following:

ORGANIZATION OF BASE AND GENERAL HOSPITALS

Surgical services.

Chief of service.

First section. General surgery (general, chest, abdomen fractures).

Second section. Orthopedic surgery.

Third section. Urology.

Fourth section. Head surgery (brain (also neurological); ear, nose, and throat; eye; oral, face and mouth).

Fifth section. Roentgenology.

Sixth section. Dentistry.

Medical services.

Chief of service.

First section. General medicine.

Second section. Neurology.

Third section. Psychiatry.

Laboratory services.

Chief of service.

First section. Pathology.

Second section. Bacteriology and serology.

Circular No. 2 of this office, November 9, 1917, is hereby revoked.

M. W. IRELAND,
Brigadier General, U. S. A., Chief Surgeon.

AMERICAN EXPEDITIONARY FORCES

Director Professional Services

Chief Consultant, Surgical Service

Chief Consultant, Medical Service

ARMY

Senior consultant, surgery, A. E. F.:

- 1 general surgery.
- 1 orthopedic surgery.
- 1 urology and dermatology.
- 1 eye.
- 1 ear, nose, and throat.
- 1 neurological surgery.
- 1 maxillofacial surgery.
- 1 Roentgenology.
- 1 research.
- 1 formations, equivalent to an army corps.
- 4 consultants (assistants to division senior consultants).

Senior consultant, medicine, A. E. F.:

- 1 general medicine.
- 1 neuropsychiatry.
- 1 formations, equivalent to an army corps.
- 2 consultants (assistants to division senior consultants).
- (Others as required.)

(Army corps)

DIVISION

Specialists: Each tactical division

(A part of division sanitary personnel, Tables of Organization)

Surgery:

- 1 orthopedic surgery.
- 1 urology.

Medicine:

- 1 neuropsychiatrist.

HOSPITAL CENTERS

Consultants, medicine (each hospital center, Services of Supply):

- 1 general medicine.
- 1 neuropsychiatry.
- (Others as required).

Consultants, surgery (each hospital center, Services of Supply):

- 1 general surgery.
- 1 orthopedic surgery.
- 1 urology and dermatology.
- 1 eye.
- 1 neurological surgery.
- 1 ear, nose, and throat.
- 1 maxillo-facial surgery.
- 1 Roentgenology.

SERVICES OF SUPPLY

Specialists: Each base hospital

(Part of unit personnel)

Surgery (as needed):

- General surgery.
- Orthopedic surgery.
- Urology and dermatology.
- Neurological surgery.
- Eye.
- Ear, nose, and throat.
- Roentgenology.
- Maxillo-facial surgery.

Medicine (as needed):

- General medicine.
- Psychiatry.
- (Others as required.)

Circular No. 26.

AMERICAN EXPEDITIONARY FORCES,
France, May 4, 1918.

1. *Requisitions for medical supplies for army troops.*—So much of Circular No. 12, office chief surgeon, A. E. F., March 6, 1918, as conflicts with the procedure prescribed in paragraphs No. 27 and No. 29, General Order No. 44, general headquarters, A. E. F., March 23, 1918, is rescinded. Organizations of the Medical Department serving with a division, corps, or army will hereafter obtain medical supplies in the manner prescribed by the general order and paragraphs cited. A combined packer's list and invoice will be furnished the receiving officer.

2. *Shipments to Medical Department repair shop No. 1.*—In connection with paragraph 2, Circular No. 23, this office, April 22, 1918, it is directed that when typewriters or surgical instruments are sent to Medical Department repair shop No. 1, an order for transport or the number of the order be mailed to the officer in charge to facilitate the receipt of such articles from railroad station. When organizations have sufficient typewriters needing minor repairs to warrant the sending of a typewriter repair man with a portable outfit to make these repairs, a request will be made directly to the officer in charge of the shop.

3. *Manner of washing mess kits.*—The Surgeon General of the Army has called attention to the fact that complaints have come from many civilian sources about the manner of dish washing or mess-kit washing in vogue in many camps, viz, that large numbers of men

rinse their kits in the same small bucket or can of water, so that late comers really use a cold or cool slop mixture. While this office is without evidence that disease has been spread by the practice complained of, it must be admitted that the practice is dirty and not in accord with the teachings of good housekeeping or good hygiene. In only exceptional circumstances will it be impossible, by the exercise of a little ingenuity, to obtain water decently clean and scalding hot for the use of each man. Surgeons with all commands are directed to do everything in their power to bring about proper practices in this matter. Should they be unable to do so, report will be made to this office.

4. *Requisitions for laboratory and X-ray supplies.*—It has become apparent that the director of laboratories and the director of Roentgenology, in order to maintain proper supervision over the technical services, must visa all requisitions for those services. Hereafter all requisitions for laboratory supplies and for X-ray supplies, including both articles listed on the supply table and articles not so listed, will be made separately and forwarded as follows:

Requisitions for laboratory supplies: To the director of laboratories, American Expeditionary Forces, U. S. A. P. O. 721.

Requisitions for X-ray supplies: To the director of Roentgenology, American Expeditionary Forces, U. S. A. P. O. 731.

It is desired that so far as possible these requisitions be so timed as to permit shipments thereupon to be included in the larger shipments made on ordinary requisitions. These special requisitions should therefore be sent approximately 10 days prior to larger requisitions contemplated and should bear notation that shipments should be held pending receipt of the requisition for general supplies.

5. *Forwarding of purchase vouchers.*—All vouchers covering purchases made under the provisions of paragraph 4, Circular No. 15, chief surgeon's office, line of communications, and all vouchers, for purchase made under the provisions of paragraph 1, Circular No. 19, chief surgeon's office, line of communications, will be sent through the section surgeon to this office, for payment by the disbursing officer attached hereto.

6. *Requisitions upon the Red Cross.*—Hereafter requisitions upon the Red Cross will be honored at the Red Cross depots after approval by the following officers:

For all troops within a division, by the division surgeon.

For all hospital and troops in the services of supply, by the section surgeons.

Attention is again invited to the fact that the Red Cross should not be asked for articles on the supply table or properly chargeable against Medical Department funds, except in emergencies, and to the undesirability of submitting to the Red Cross requisitions for articles erased from the medical supply tables by reason of their unimportance.

7. *Purchase of food supplies locally to be charged against hospital fund.*—Due to the fact that local French authorities are not authorized to receive payment for supplies purchased from them the United States Government is receiving bills from the French Government for food supplies purchased by United States Army hospitals. Commanding officers should bear in mind that there will be ultimately a charge against the hospital fund and should keep accurate track of all such purchases and the cost thereof and should consider the same an outstanding charge against the hospital fund, reserving a sufficient balance to enable prompt reimbursement to the fund from which these bills are paid.

8. *Purchase of technical apparatus locally.*—It is believed that many small purchases, particularly of surgical instruments and minor technical apparatus, are being made in the local markets. This is no doubt due to the fact that there was great difficulty in securing these articles from the supply department in the early days. A well-balanced and well-maintained shipment of such equipment is now being received from the United States, and it is desired that all requests for this material should pass first through the medical supply depot; the officer in charge of which will, if necessary, make request upon the purchasing officer.

M. W. IRELAND,
Brigadier General, N. A., Chief Surgeon.

NOTE.—Circular No. 25 has been delayed and will be issued later.

Circular No. 27.

AMERICAN EXPEDITIONARY FORCES,
France, May 13, 1918.

1. *Administration of messes—Function of dietitian.*—The reports of medical inspectors and officers of the food and nutrition section show that the administration of messes is, as a rule, the least efficient and satisfactory part of hospital administration. The defects noted are a monotonous and ill-balanced dietary, poor service, and lack of cleanliness in the kitchen and the kitchen personnel. These inspections show that commanding officers have not made proper use of the agency which is especially intended to correct these defects, that is to make proper use of the dietitians who have been assigned to the base hospitals, to use their expert knowledge for the correction of these defects, and to exercise the constant vigilance and attention to detail which is necessary for successful mess administration.

Dietitians are trained experts in nutrition and food preparation. If not trained nurses, they are civilian employees having a status analogous to that of a trained nurse. The function of the dietitian is to supervise the preparation not only of the special diets, but to make out the bills of fare and supervise the preparation of all food furnished by the Government. The dietitian has expert knowledge of which the commanding officer should make the fullest use for the benefit of his command. She should be able to relieve the mess officer from the burden of details required to secure a well balanced ration, proper variety and preparation, and a good service. The mess officer should make a daily inspection, accompanied by the dietitian and the mess sergeant, to see that the details of a good service are carried out fully and completely.

Like all other women of the personnel of a base hospital, the dietitian is under the disciplinary authority of the chief nurse.

2. *Instructions for the use of the Lyster water sterilizing bag.*—(a) The following instructions for the use of the water sterilizing bag (Lyster) are published for the information of all concerned:

- (1) Clean the inside of the bag thoroughly.
 - (2) Fill it to the white band, with best water available.
 - (3) Place a tube of hypochlorite in an ordnance cup and break the tube with the butt of an ordnance knife. Mix the powder into a smooth paste with a little cold water, using the blade of the knife to break up the lumps. (Hypochlorite tends to lump when added to water and, therefore, special care must be taken to obtain a smooth paste.) Fill the ordnance cup about half full of cold water, stir and pour the nearly clean solution into the water in the bag, keeping the glass in the cup. Stir the treated water thoroughly.
 - (4) Fasten the cover on the bag and allow the water to stand 30 minutes before use.
 - (5) Never refill a partially emptied bag. Always empty the water from the bag before filling with fresh water.
 - (6) Use one tube of powder for every bag full of water. Tubes of hypochlorite are to be obtained from the quartermaster.
 - (7) Report any difficulties to the medical officer.
 - (8) Keep a record of the treatment attached to the card.
- (b) Cards containing these directions on waterproof paper are in source of printing and will soon be available for issue.

3. *Bandaging of mustard gas cases.*—The direction du Service de Sante of the first French Army has sent to this office the following "Note de service":

It has been called to my attention that men suffering from mustard gas conjunctivitis are evacuated with cotton tightly bandaged over their eyes. This is an improper dressing. The lids should be compressed as little as possible. A small compress of dry gauze, and a loose bandage should be applied.

4. *Nurses' service chevrons.*—The War Department has informed general headquarters that under date of January 12, 1918, authority was given for members of the Army Nurse Corps to wear war service chevrons under the same conditions heretofore prescribed for officers and enlisted men.

5. *Vouchers to be forwarded to this office.*—Attention is invited to Paragraph 2, Circular 5, chief surgeon, line of communications, September 21, 1917. All vouchers pertaining to money or property accountability, which formerly have been forwarded to the Surgeon General, United States Army, will, in future, be forwarded to this office.

6. *Visiting places for convalescent officers.*—Commanding officers of hospitals are notified that the persons whose names and addresses are given below have expressed a willingness to receive in their homes as guests, free of all expenses, convalescent officers to the limit of the accommodations. Commanding officers should exercise judgment in the selection of cases which will be received on their recommendation, and should not send any who are not fully able to look after themselves or require hospital treatment. There is, however, a Red Cross physician in the town of Cannes who can give treatment in the case of emergency. Before sending an officer to either place the commanding officer should ascertain by telegraph whether it is convenient for the host to receive him. The chief surgeon's office should be notified by mail of each case in which an officer has availed himself of this hospitality, and given the name and organization of the officer, and the date.

Capt. Clement Brown, Villa-les-Lotus, Cannes (A. M.).

Mr. Samuel Goldenberg, Nellecote, Villefrance-sur-Mer (A. M.).

7. *Disposition of psychiatric, pulmonary tuberculosis, and war neuroses cases.*—(a) Psychiatric cases, including those of insanity and feeble-mindedness, should not be held for prolonged observation, but should be sent to Base Hospital No. 8, provided the cases are in fit condition to make the journey. Upon request, special trained attendants will be sent from Base Hospital No. 8 to care for the cases en route. Such request should state the character and condition of the cases. On account of the local restrictions as regards transportation of the insane, a diagnosis will not be made, nor will the patient be declared insane or classified as of class D. Carefully prepared histories will be forwarded to the commanding officer of Base Hospital No. 8.

(b) For the present, cases of pulmonary tuberculosis should be sent to Base Hospital No. 8. Such cases should not be classified as of class D before transfer.

(c) Cases of war neuroses should be transferred to Base Hospital No. 117.

M. W. IRELAND,
Colonel, M. C., Chief Surgeon.

Circular No. 28.

AMERICAN EXPEDITIONARY FORCES,
France, May 15, 1918.

Subject: Sick and wounded reports for the American Expeditionary Forces.

* * * * *

(ADDITIONAL INSTRUCTIONS FOR FORM 22, A. G. O., S. D., A. E. F. (SEC. V))

1. When giving admissions on "Daily report of casualties and changes of patients in hospital," Form No. 22, A. G. O., S. D., A. E. F., "Line of duty" or "Not in line of duty" may be specified by "L" or "N" in quotation marks.

2. On that form, diagnosis, in addition to including nature of disease, injury, or wound, will specify regional location of wounds, slight or severe ("O" or "S"), in action or accidentally incurred ("I. A." or "Acct.").

(AMENDMENT TO SECTION XVI (ALLIED PATIENTS IN A. E. F. HOSPITALS))

FRENCH PATIENTS

1. Paragraphs 3 and 4 of this section are revoked.

2. When French military patients are admitted to, discharged from, or die in American military hospitals in the French zone of the armies, notification of the fact will be sent within 24 hours to the Chief of the Bureau de Compatibilite of the Service de Sante des Armees, No. 1 Rue Lacretelle, Paris, on Form 52, Medical Department.

3. When French military patients are admitted to, discharged from, or die in American military hospitals in the French zone of the interior, notification of the fact will be sent within 24 hours to the Franco-American section of the region (Service de Sante) on Form 52, Medical Department.

4. The data on this card will show the name, number, rank, and organization of the patient, the diagnosis, whether or not the disability was incurred in line of duty, and the designation of the hospital sending the report.

5. Information in this form is strictly for the use of the French. No duplicates of these cards will be sent to the chief surgeon's office, A. E. F. The monthly list, required in paragraph "1-b" of this section, is sufficient.

BRITISH PATIENTS

6. For all British patients admitted to A. E. F. sanitary formations, A. E. F. medical cards, envelopes, etc., will be made out except where British forms have previously been used.

7. A separate daily list of casualties and changes of patients in hospitals, Form 22, A. G. O., S. D., A. E. F., will be made out for all British patients; one copy will be forwarded to the deputy adjutant general's office, Third Echelon, British Expeditionary Force, France, and another to medical communications, British Expeditionary Force, France. No copy will be sent to the chief surgeon, A. E. F.—the monthly report called for in "1-b" being sufficient.

8. When cases of British patients have been completed by death, return to duty, or otherwise than by transfer, field medical card, envelope, and contents will be sent at the end of the month to the deputy adjutant general's office, Third Echelon, British Expeditionary Force, France, together with a list of the names of the cases so completed. No report, Form 52, need be made out.

9. If patient is transferred to a British medical unit, field medical card, envelope, etc., will be forwarded attached to the patient.

CHANGE OF SYSTEM

1. All surgeons with troops will, upon arrival in France or England, complete the records of all cases actively on the register either as "Returned to duty" or "Transferred to —— Hospital," as the case may be. Thereafter the system set forth in this pamphlet will prevail. If cases completed as "Returned to duty" are subsequently transferred to hospital, they will be considered new cases.

2. Cases transferred to convalescent camps will be considered completed as far as sick and wounded records are concerned.

3. For the purposes of reporting sick and wounded under the new system, all medical organizations which do not habitually hold patients for more than three days will be considered as without hospitalization facilities.

COMPLETENESS OF DATA

1. Whenever a patient is received by a base hospital without field medical card or data sufficient to completely fill one in, steps will be taken to obtain the necessary data, and the patient will be held a reasonable time in the hospital until the lacking information is received and the card and envelope made out. Whenever this is done, statement of the fact will be made on the back of the card, reference being made to it by an asterisk (*).

2. In stating causes of death, care will be exercised to report in terms which describe the true cause rather than the symptoms. Reference should be made to the "Nomenclature of diseases," Manual of the Medical Department, 1916, page 144-156, and the terminology therein will invariably be used.

PROCURING OF FORMS

1. Units arriving in France or England after June 15, 1918, will requisition immediately for forms. Form No. 4, A. G. O., S. D., A. E. F., will be procured from the adjutant general's office statistical officer, the others through the usual channels.

2. Troops serving with the British will not make requisition for these forms, but will use the British system. This will not apply to Form 22, A. G. O., S. D., A. E. F. or Form 52 M. D. as used by the A. E. F. base hospitals with the British in France.

IMPORTANT

1. Weekly telegraphic report, Form 211, M. D., will be continued to and including the last week in July.

2. All previous instructions at variance with this circular are revoked.

3. It is essential that all medical officers in the A. E. F. have a full understanding of the new system. Questions should be addressed to the chief surgeon, A. E. F., Services of Supply.

4. If the supply of this circular and pamphlet describing the new system is not sufficient to furnish each medical officer in your command with a copy, request should be made for a further supply. Care must be exercised, however, to avoid waste.

5. Every organization will send weekly venereal report to division or section surgeon, even though no new cases have appeared since last report. It is essential that the strength of divisions and sections be obtained through this report.

6. Attention is called to the fact that Forms No. 4 and No. 22, A. G. O., S. D., A. E. F., are used by both the adjutant general's office and the Medical Department. Instructions issued by either agency relative to methods of sending reports on these forms apply only to the copies sent to that agency. Two copies of Form No. 22, A. G. O., are required to be sent direct to the chief surgeon's office; Form No. 4, A. G. O., is not to be sent to that office.

M. W. IRELAND,
Brigadier General, N. A., Chief Surgeon.

Circular No. 29:

AMERICAN EXPEDITIONARY FORCES,
France, May 21, 1918.

The following instructions are issued for the guidance of all medical officers, superseding Circular No. 11, chief surgeon's office, March 6, 1918:

1. Injuries to the bones and joints, as well as of the muscles and tendons adjacent to these structures, represent a large percentage of the casualties of both the training and the combat periods of an army.

2. To restore useful function to these injured structures is one of the purposes of the medical organization of the army. The problems involved in this have to do not only with the cleansing and healing of the wounds, but also with the restoration of motion in the joint or strength to the part. This latter part naturally follows the first, but it is essential that the first part be carried out with reference to that which is to follow. Unless this second part of the treatment, the restoration of strength and motion, is carried out, much of the first part is purposeless.

3. To insure the man not only the proper treatment for this type of injury, but the proper supervision until he is as fully restored as possible, necessitates some form of radial control that makes it impossible for a man to be overlooked in inevitable transfers, from service to service, or hospital to hospital.

4. Since so much of the ultimate result in these conditions depends upon orthopedic measures after the first treatment of the wounds has been carried out, the following will govern:

The senior consultant, orthopedic surgery, will, under the chief consultant, surgical services, make such recommendations relative to treatment of "injuries and diseases of the bones and joints, other than those of the head, as well as the injuries or diseases (other than nerve lesions) of the structures involved in joint functions," as will insure early restoration of functions, shorten convalescence, and hasten return to active military duty.

He will also supervise the subdivisions of surgery, pertaining to bones and joints, in a manner which will permit the complete surgical harmony necessary for cooperation in treatment of these cases by either general or orthopedic surgeons, in formations from front to rear. To insure a minimum loss of function to the parts involved, uniform cooperation must be maintained by the chief consultant, surgical services, during both early treatment and all stages of convalescence.

5. To carry out the provisions of this circular, the chief consultant, surgical services, will make such provisions as are deemed necessary to insure a complete survey of these cases at regular intervals, and determine if the treatment is progressing in a satisfactory manner. Consultants in orthopedic surgery who are charged with the supervision of such cases within hospital centers and other formations will ordinarily be called in consultation

for special cases, through the commanding officers of the units in question, and the consultants will report to him prior to completion of their investigations. Commanding officers of hospitals are expected to freely utilize the services of these consultants in the manner described above. Any recommendation made by them as to change of treatment, or transfer to some other professional service or hospital, will ordinarily, if the military situation permits, receive favorable consideration.

6. It is not the intention of this order to interfere with the routine work of hospitals, but to insure to the soldier proper supervision during the time of his treatment and the period of his convalescence.

M. W. IRELAND,
Brigadier General, M. C., N. A., Chief Surgeon.

Circular No. 30.

FRANCE, May 23, 1918.

1. *Auxiliary optical units supplying and repairing of spectacles.*—(a) An auxiliary optical unit has been sent to each of the following stations, viz, Base Hospital No. 6; Base Hospital No. 8; Camp Hospital No. 27; Base Hospital No. 1; Base Hospital No. 18; attending surgeon's office, general headquarters; Base Hospital No. 17; Base Hospital No. 23.

A central optical unit has been sent to the instrument repair shop of the medical supply depot in Paris.

(b) Prescriptions for spectacles, to be supplied free of charge to officers, nurses, and enlisted men of the American Expeditionary Forces may be sent to the commanding officers of these stations.

These standard spectacles are of nickel, steel, round glass, and any combination of lens can be supplied or repairs made on short notice.

Unusual prescriptions and ordinary prescriptions for troops near Paris may be sent to the central unit. This unit will also fit glass eyes or upon request will send to base hospitals assorted sets of eyes for selection.

It will also repair any optical instruments used in hospitals.

(c) Prescriptions should include not only the lens prescription, but accurate measurements for frame, stating the following dimensions, viz, pupillary distance; temporal width; height of crest above pupillary line; width of bridge at the base; inset or outset, in millimeters; length of temple.

As the size of the lens will be the same in all cases, namely 40 mm., it will not be necessary to state that dimension.

2. *Historical records.*—(a) With a view to securing material from which the medical and surgical history of the war may eventually be written, base surgeons and division surgeons will prepare and maintain a historical record of the Medical Department activities of the commands of which they are in charge.

(b) Commanding officers of base, camp, and other hospitals, hospital train, and other independent organizations of the Medical Department will also maintain such a record.

(c) The historical data need not be voluminous nor trivial, but should be sufficiently complete so that from them in connection with the regular official and clinical records of the organization a report to date of its activities can at any time be made. The historical records, if not already begun, will be initiated without delay and written up from the beginning of the activities of the organization or command in connection with the present war and they will be maintained by careful notation of all matters of historical interest involving the organization.

3. *Replacement of X-ray tubes.*—Broken X-ray tubes will be sent to the repair shop, Paris, by messenger, who will carry back the replacement tube. Unless urgent, two or more tubes should be sent at one time. If the travel involved requires an order from the commanding general, Services of Supply, a request for such should be made to these headquarters.

4. *Travel orders and classification of patients discharged from hospital under General Order 41, general headquarters, 1918.*—Orders directing the travel of patients discharged to duty from Services of Supply hospitals should in each instance indicate the classification to which the man belongs under General Order 41, general headquarters. In the case of men of B and C classes, copies of reports of disability boards on the prescribed form should be attached to travel orders.

The authority for issuing the travel order should be indicated therein as: "G. O. 11 S. O. S., 1918."

5. *Admission of officers and soldiers to Services of Supply hospitals.*—The attention of commanding officers of Services of Supply hospitals is called to the following extract of General Order 46, general headquarters, the provisions of which have been disregarded in number of instances. Prompt rendition of the required report is enjoined:

SEC. VII (par. 4.) To insure the information reaching the unit commander, as to the admission of an officer or soldier of his command to a Services of Supply hospital, the Services of Supply hospital commanding officer who receives the individual will notify the unit commander at once.

6. *Demands for chloride of lime or chlorine products.*—The supply situation is such that all demands for chloride of lime or chlorine products should be restricted to those which are absolutely of an emergency type, and requirements should be the lowest possible.

7. *Nurses' regulation uniforms.*—The regulation uniform is to be worn by nurses and reserve nurses of the Army Nurse Corps at all times, and is as follows:

A suit, waist, and hat, of prescribed color and pattern for outdoor wear; gray or white uniforms, aprons, and caps, will be worn while on duty in hospital, and shall be made in accordance with specifications furnished by the office of the Surgeon General, but reserve nurses will wear caps made in accordance with specifications furnished by the Red Cross; white, tan, or black shoes, high or low, may be worn, but pumps, French heels, and fancy shoes will not be allowed; the United States pin and the insignia of the Army Nurse Corps should be worn, but not fancy pins or furs. There are no occasions when the wearing of civilian dress will be permitted, and any individual modification of the regulation uniform will not be allowed.

M. W. IRELAND,

Brigadier General, M. C., N. A., Chief Surgeon.

Circular No. 31

FRANCE, May 23, 1918.

Subject: evacuation of French and British patients in A. E. F. hospitals; effects of allied patients dying in A. E. F. hospitals.

1. Paragraphs 2 and 3, Section XIV, and paragraph 2, Section XVI, "Sick and wounded reports for the American Expeditionary Forces," are revoked.

2. The following translation of extracts from Circular 684 Ci/7, Sous-Secrétaire d'Etat du Service de Sante, of April 6, 1918, are published for the information and guidance of medical officers:

AMERICAN SOLDIERS IN FRENCH SANITARY FORMATIONS

The French sanitary formations must keep only American sick and wounded who can not be evacuated without inconvenience. Consequently, as soon as an American patient is susceptible of being evacuated, he will be evacuated to the nearest American hospital without other formality than a previous understanding with the chief surgeon of that hospital.

If, for any reason, the transfer of the patient necessitates the presence of nurses, the surgeon of the American hospital should be requested to send one or two nurses to insure the transfer in satisfactory conditions.

Medico-surgical documents which may be useful to the American doctors regarding the patient will follow the latter, those of confidential nature being sent under closed envelope.

FRENCH SOLDIERS IN AMERICAN SANITARY FORMATIONS

French soldiers hospitalized in American sanitary formations will be evacuated to the nearest French hospital as soon as their transfer can be made without risk.

The evacuation of the sick and wounded will take place without any other formality than a previous understanding with the *medecin chef* of the French hospital, who will furnish one or several nurses if necessary.

All medico-surgical documents will follow the patient under closed envelope.

AMERICAN SOLDIERS DEAD IN FRENCH HOSPITALS

(a) *Hospitals of the zone of the army.*—In conformity with steps foreseen for allied soldiers in the instructions of July 2, 1916, the property of American soldiers dead in French hospitals will be forwarded to the "Chef de Bureau de Compatibilite du Service de Sante aux Armees," No. 1 Rue Lacrosetell, Paris, where they will be transmitted to the commanding officer, effects depot, base section No. 1, at St. Nazaire.

Cash will be forwarded by order on the Treasury made out to the commanding officer of this last named depot.

(b) *Hospitals of the zone of the interior (includes regional hospitals of the army zone).*—The forwarding of soldiers' personal property will be made by the administration officer to the commanding officer, effects depot, base section No. 1, at St. Nazaire.

FRENCH SOLDIERS DEAD IN AMERICAN HOSPITALS

(a) *Hospitals of the zone of the army.*—The personal property of French soldiers dead in American hospitals will be forwarded to the French military mission with the American Army at Chaumont.

(b) *Hospitals of the zone of the interior (includes regional hospitals of the army zone).*—The personal property will be turned over to the commanding officer of the nearest French hospital, permanent military hospital, or complementary hospital, who will look after the settlement.

NOTE.—In all cases mentioned above it will be necessary to make out in a complete manner on a form of accompanying model an inventory of the personal property; in each case the inventory will be forwarded at the same time as the personal property to the consignee:

(Translation of form to be utilized in accompanying personal property of soldiers forwarded)

Ministry of war, Office of Pensions, Bureau of Successions, Paris, 1 Rue Lacrosetelle (15th)

Numbers { Of the present form.
 { Of the parcel.

From ^a

Address

Name of the soldier

Surnames ^b

Regiment

Rank Class

Place of enlistment

Number of enlistment

Died at

On the

Address of family

(a) Amount of cash comprised in the shipment Indicate whether cash has been forwarded in any other way, how much, and to whom forwarded

(b) Savings Book No.

(c) Detailed statement of amount and objects forwarded

Date 191--

(Signature of sender)

NOTE.—Send the form and shipment to the above address.

^a Indicate name of hospital and address.

^b All surnames and in their proper order.

EVACUATION OF BRITISH PATIENTS

3. British patients in American hospitals fit to travel should be evacuated to Paris. The office of the assistant director medical services, British Expeditionary Force, No. 6, Rue Capucines, Paris, should be given 24 hours' notice by telegraph of date and hour of arrival of patients. Patients should be evacuated by express train and should be routed so as not to arrive in Paris late at night.

The personal effects of British soldiers dying in A. E. F. hospitals should be sent to the deputy adjutant general (effects branch), headquarters, third Echelon, British Expeditionary Force, France. Public clothing and equipment should be sent to the commanding officer, ordnance base, British Expeditionary Force, France.

M. W. IRELAND,
Brigadier General, M. C., N. A., Chief Surgeon.

AMERICAN EXPEDITIONARY FORCES,
France, June 7, 1918.

Circular No. 32.

1. The following "don'ts" for the guidance of medical officers in gas warfare have been prepared by the medical director of the gas service and are hereby published.

THIRTY "DON'TS" WITH WHICH EVERY MEDICAL OFFICER IN THE AMERICAN EXPEDITIONARY FORCES SHOULD BE THOROUGHLY FAMILIAR

1. Don't fail to realize that gas warfare is the most dangerous enemy confronting our army to-day and that a great number of patients will be gassed.
2. Don't fail to keep thoroughly posted in all matters pertaining to warfare gasses.
3. Don't forget that common sense and good judgment are the essential requirements in treating gassed patients.
4. Don't fail to realize that the enemy uses every kind of device in his endeavors to make gas attacks serious.
5. Don't fail to realize that the enemy uses many different kinds of gasses, sometimes alone, at other times mixed together. Each gas produces its separate and distinct line of symptoms, and therefore requires its own particular line of treatment.
6. Don't forget that all gassed cases require: First, rest; second, warmth; third, fresh air; fourth, attention.
7. Don't permit gassed men to walk, talk, or move about.
8. Don't fail to realize that all gassed cases should be considered as serious until proven otherwise.
9. Don't fail to keep all gassed cases under strict observation during the first 48 hours.
10. Don't forget that lung irritants such as phosgene and chlorine act early and that deaths in the trenches or front lines during a gas attack are probably due to one of these gasses.
11. Don't forget that the lesions produced by warfare gasses are: (a) Lesions resulting from local actions of the gas; (b) lesions due to complications and mechanical results of local action; (c) lesions due to general toxic effects.
12. Don't forget that disturbances caused by mustard gas are characterized by more or less late symptoms of irritation and by vesicle formation in the integuments and mucous membranes, especially the conjunctival, nasal, pharyngeal, and laryngeal, which are produced chiefly by direct action of the vapor and small droplets which are acid.
13. Don't forget that broncho-pneumonia resulting from secondary infections often follow mustard gas poisoning.
14. Don't forget that clothing, linen, blankets, etc., remain for a long time impregnated with mustard gas.
15. Don't forget that fumes and vapor of mustard gas remain in certain localities for days following gas attacks.

16. Don't forget that essentials indicated in the treatment of mustard gas poisoning are: First, removal of clothing; second, neutralizing of acid gas with an alkaline substance; third, avoiding contact with soiled clothing; fourth, treatment of the eyes, lesions of mucous membranes, lesions of the respiratory tract, lesions of the digestive tract, and lesions of the skin.

17. Don't forget that cases of irritant gas poisoning, with severe oedema of the lungs, may often be saved by prompt and copious bleeding.

18. Don't forget that cases of gas poisoning with marked cyanosis are benefited by oxygen inhalations, which in order to be efficient should be given continuously. The oxygen to be administered either by mask or introduced into the posterior nares by means of a small rubber catheter connected with the oxygen tank through a double tube in a bottle half filled with water.

19. Don't place too much reliance on drugs in the treatment of gassed cases.

20. Don't forget that disorders of the heart which arise after gassing will in some cases make soldiers unfit for active fighting in the front areas.

21. Don't bandage the eyes. Pressure bandage over the eyes locks up the lids and retains the secretations, which after a term of hours may become purulent.

22. Don't forget that in treating eye symptoms following mustard gas poisoning, it is most important that the use of eye shades or dark glasses should not be continued beyond the inflammatory stage, otherwise functional photophobia is likely to result.

23. Don't forget that one group of symptoms often seen in all forms of poisoning—i. e. dyspnoea, pain in the chest, palpitation, rapid pulse, dizziness, and fatigue are closely associated with nervous symptoms more frequently than other cases. They cause the most frequent contributions of partial or complete unfitness for further military duty.

24. Don't forget that the symptoms enumerated above rarely follow mustard gas poisoning.

25. Don't forget that in this class of patients prolonged rest in bed is contraindicated. They should be given graduated exercises, and their physiological reaction to these should be carefully noted.

26. Don't forget that prolonged stay in hospitals is particularly apt to exaggerate neurotic conditions which are difficult to overcome.

27. Don't forget that vomiting and stomach trouble which persist after mustard gas poisoning is usually functional, especially when occurring some months later.

28. Don't forget that the nervous symptoms which follow gas poisoning are generally functional, resembling exactly "traumatic neurosis."

29. Don't forget that pulmonary cases following mustard gas poisoning are the most important. They entail prolonged absence from military duty and may simulate pulmonary tuberculosis so closely that it will be difficult to decide, in some cases, whether tuberculosis exists or not.

30. Don't forget that it is often difficult to differentiate between slightly gassed cases and malingering, so don't be misled by the latter condition.

M. W. IRELAND,

Brigadier General, M. C., N. A., Chief Surgeon.

Circular No. 33.

AMERICAN EXPEDITIONARY FORCES,

France, June 12, 1918.

1. *Hospitalization and evacuation of cases of pulmonary tuberculosis and suspected pulmonary tuberculosis* —(a) Collecting and observation centers have been established at the hospitals indicated below for cases of pulmonary tuberculosis and suspected pulmonary tuberculosis which may occur in the American Expeditionary Forces.

(b) In future the diagnosis "pulmonary tuberculosis" should be limited to cases in which tubercle bacilli are found in the sputa. Cases in which this diagnosis has been established should be evacuated to Base Hospital No. 8, at Savenay, or to Base Hospital No. 3, at Vauclair, which are designated as collecting centers for these cases during the period preceding their evacuation to the United States.

(c) Cases of suspected tuberculosis should be diagnosed "tuberculosis, observation." Such cases should be evacuated to Base Hospitals No. 8, No. 3, or No. 20, at Chatel Guyon, which are designated as observation centers.

(d) Base Hospital No. 3 will receive only such cases as originate in base sections No. 2, No. 6, and No. 7. For cases originating elsewhere the hospital most convenient to the locality will be selected.

2. *Return to duty of student officers and soldiers from army and corps schools.*—Instructions have been received from the commander in chief directing that student officers and soldiers from army and corps schools who have been admitted to hospitals will be returned to the school upon being evacuated to duty as of class A.

3. *Travel orders to individuals or units forwarded to the advance section.*—The following instructions of the commander in chief, A. E. F., are published for the information and guidance of medical officers:

(a) Hereafter all individuals or units forwarded to the advance section will be given travel orders indicating the organization to which they are to be sent, and will be directed to report to the proper regulating officer, who knows the location of all organizations and will see that they are forwarded to the proper destination.

(b) In case of doubt as to which is the proper regulating officer to whom they should be directed to report, information will be obtained by the officer arranging for the movement from the headquarters, Services of Supply.

All such individuals or detachments should be furnished with rations to include two days' travel beyond the time of their expected arrival at the regulating station.

By order of the commander in chief.

4. *Etiquette of visits to French hospitals.*—Correspondence recently received from the French Service de Sante indicates that in certain cases medical officers of the American Expeditionary Forces have visited American patients in French hospitals without first calling on the medecin chef of the hospital to get his permission.

It is a military principle which governs in all armies, to which the French attach much importance, that an officer should not go into any military organization for the purpose of inspecting without first calling on the commanding officer of that organization to get his permission. It is very desirable when the visit is one of inspection, and not merely a personal visit to individual patients, that the medecin chef or an officer designated by him should accompany the American medical officers. This is an important matter of military administration, as well as military courtesy, which all medical officers should be careful to observe.

5. *Method of requisitioning fuel.*—The attention of commanding officers of hospitals is invited to the provisions of General Order 19, Services of Supply, 1918, which order makes certain changes in the method of requisitioning fuel. The chief quartermaster advises that, as far as possible, supplies of fuel for hospitals for winter use be secured and stocked during the summer. It is especially desired that emergency requisitions for fuel be reduced to a minimum. Proper anticipation of the demand for wood is fully as essential as that for coal.

6. *Worker's permits for all nurses.*—Attention is again invited to the fact that all nurses must be provided with worker's permits. These are furnished as prescribed in General Order 63, A. E. F., 1917. Three unmounted photographs, not to exceed $3\frac{1}{2}$ by $2\frac{1}{2}$, name of the nurse, permanent station, and number of passport, if any, must be furnished. Requests for worker's permits should be forwarded to this office, giving the data stated above.

7. *Vouchers and pay rolls to be sent through proper channels.*—Paragraph 1, Circular No. 14, office of the chief surgeon, headquarters lines of communication, A. E. F., December 4, 1917, is modified as follows:

All vouchers and pay rolls will hereafter be sent through proper channels directly to this office instead of to the officer in charge, intermediate medical supply depot No. 3. Requisitions will continue to be sent as directed in the circular quoted.

8. *Report of all divisions surgeons.*—(a) All division surgeons will report immediately to this office by wire the designations of all field hospitals operating under their control and subsequently any change in status in field hospitals, such as the opening, closing, consolidation, reorganization, or abandonment of such units as soon as such changes occur.

(b) For the purpose of reporting sick and wounded under the new system, all medical organizations which do not habitually hold patients for more than three days will be con-

sidered as without hospitalization facilities. All units which care for patients for a period longer than three days will be considered as hospitals regardless of official designation. All units in the sections of the Services of Supply falling under the latter class, but which are not officially designated as hospitals, will be instructed by the section surgeon to begin reporting as hospitals and to make requisition on medical supply depot No. 3 for necessary forms. Requisitions for Form No. 1, M. D., A. E. F., will be filled as soon as supply is available. Section surgeons will notify this office of all such units in their sections.

M. W. IRELAND,
Brigadier General, M. C., N. A., Chief Surgeon.

Circular No. 34.

AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON,
France, June 12, 1918.

The following information will be given the widest possible circulation among the medical officers of the American Expeditionary Forces. Each medical officer should possess and keep at hand a copy of this circular.

SHORT RÉSUMÉ OF THE SYMPTOMS AND TREATMENT OF POISONING BY IRRITANT GASES^a

The gases which have been met with most commonly up to the present time may be divided schematically into three classes:

- (1) Suffocative gases, which exercise their main effect on the lung tissue (chlorine, phosgene, diphosgene, chloropicrin).
- (2) Vesicants, the prime effect of which is exercised upon the skin conjunctivæ and upper air passages (dichlorethyl sulphide-mustard gas or Yperite).
- (3) Pure lachrimatory gases (Xylyl-bromide).

Gas may be liberated from cylinders in clouds, a method not now commonly employed or from shells.

The general aim of the enemy in the present use of gas shells is to fire simultaneously shells of different types, some of which will cause so much sensory irritation that the man will discard his respirator and then become vulnerable to lethal shells, phosgene and similar substances. Owing to this mixture of shells the symptoms reported by patients are often very confusing.^b

For this purpose several arsenical compounds have been tried.

SYMPTOMS OF GAS POISONING

Suffocative gases.—Suffocative gases which are relatively nonirritative on inhalation in the concentrations ordinarily used, induce some hours after their entrance an intense œdema of the lungs. Through the great outpouring of fluid into the lung tissue the patient drowns in his own serum; the blood becomes greatly condensed and viscous; there is marked polycythæmia; the capillary flow is obstructed; thromboses are not uncommon; a greatly increased strain is put upon the right heart; the patient suffers from intense oxygen want.

Sequence of events.—The immediate effects of irritation of the eyes may be prominent at first, but as a rule quickly pass off; within 3 to 12 hours after exposure to the gas the main symptoms, asphyxia and prostration, due to affection of the lung alveoli and accumulation of fluid in them, appear. In this state the patient's respiration is rapid and usually accompanied by pain (often intense) in the chest; there may be fits of coughing, but the amount of expectoration is very variable, being profuse in some cases and very scanty in others; in the more severe cases the patient is restless and anxious, or may be semicomatose with muttering delirium. Therefore many patients will be unable to give a definite account of their symptoms as loss of memory of immediate events may last for several days. Patients with severe pulmonary œdema fall into two groups.

^a Much of this material has been extracted from the valuable reports of the British Chemical Warfare Medical Committee and from the excellent report of Lieut. Col. H. L. Gilchrist, issued by the office of the Chief of Gas Service, A. E. F., Mar. 15, 1918.

^b Medical Research Committee: Reports of the Chemical Warfare Medical Committee, No. 3. The symptoms and treatment of the late effects of gas poisoning, Apr. 10, 1918, p. 3.

(a) Those with definite venous engorgement. In these the face is congested, the lips blue, and the superficial veins of the face may be visibly distended. There is true hyperpnœa, i.e., the breathing is not only increased in frequency but the actual amount of air reaching the lungs is greater than normal. The pulse is full and of good tension, and the rate is not often much above 100.

(b) Those with collapse. In these the face is pale and the lips of a leaden color. The breathing is shallow, so that there is but little hyperpnœa. The pulse is rapid (130 to 140) and weak.

In patients who recover, the œdema fluid is absorbed within a few days; in some cases signs of bronchitis or broncho-pneumonia, due to a secondary infection, persist for some time but in most cases the lung returns to a condition which is normal except for the presence of some disruptive emphysema. In consequence, however, of the œdema of the lungs during the early stage, deficient oxygenation of the blood occurs, unless prevented by the administration of oxygen. The deficient oxygenation gives rise to widespread temporary injury in the various systems-----.

2. *Vesicants*.—The only one hitherto employed is dichlorethyl sulphide, an oily liquid used in shells, and scattered from them to the ground, where it slowly evaporates. This not only attacks those in the immediate vicinity of the shell burst, but may affect those who may walk over the contaminated ground later. The fluid may be spattered also on clothing, shell casings, rifles, etc., and may thus become effective through direct contamination of the skin.

The main action of this group is an irritant one on the skin, eyes, and respiratory passages.

Special symptoms.—(a) Early: These are insignificant, nothing being noticed immediately except a smell reminiscent of mustard, from which the gas derives its name (mustard gas). A soldier may not realize for many hours that he has been exposed to gas, until the more important delayed symptoms develop.

(b) Delayed: These are the principal symptoms of this group and appear 3 to 24 hours after being gassed. They occur usually in the following order, and approximately after the intervals stated.

(i) Conjunctivitis (3 hours). This rapidly becomes very acute, and is accompanied by intense photophobia and swelling of the lids, which may cause closure of the eyes for days.

(ii) Vomiting and epigastric pain (4 to 8 hours). These symptoms appear together as a rule, and are apt to be persistent and intractable.

(iii) Burns (12 hours). Widespread erythema with local vesication occurs, going on to definite burns. The commonest sites are the axillæ, genitals, and back, but no area may be exempt. The affected surfaces frequently develop very marked pigmentation. Deep burns sometimes occur when the liquid itself comes into contact with the clothes or skin.

(iv) Laryngitis, pharyngitis, tracheitis, and bronchitis (24 to 48 hours). These are the most dangerous symptoms. The degree and extent of the lesion may vary from a simple irritation of the surface to an ulceration of the mucous membrane of the whole passages, followed by infection of the raw surfaces. These conditions may be so extensive and severe as to cause death by themselves or in consequence of the development of broncho-pneumonia.

In a certain number of cases with severe involvement of the respiratory organs, which recover, there has evidently been some interference with the proper oxygenation of the blood, which may give rise eventually to symptoms resembling the after effects of the suffocative gases * * *.

When a soldier is protected by the respirator, the respiratory and eye symptoms are absent or slight.^c

TREATMENT

Suffocative gases.—The grave symptoms here are due mainly to the intense pulmonary œdema. The conditions which we have to combat are essentially: (a) Oxygen want, (b) condensation of blood, (c) overburdening of the right heart. Our main aims are: (a) Rest, (b) warmth, (c) Oxygen, (d) bleeding.

(a) Rest: Protect the patient from all unnecessary physical effort in order to reduce the oxygen needed. Do not disturb him at the advanced aid station by questioning; his life may depend on the care with which he is handled in the early stage.

All the gassed should be stretcher cases. Small oxygen tubes, if available, should be carried in each ambulance in the proportion of one to each stretcher case, and exchanged at the evacuation hospital for freshly filled tubes; these can of course be used only when the ambulance has passed out of the gassed area.

^c Medical Research Committee: Reports of the Chemical Warfare Medical Committee No. 3. The symptoms and treatment of the late effects of gas poisoning. April 10, 1918, pp. 3-4.

Give the patient fresh air. Do not close the ambulance too tightly unless it be very dusty.

(b) Warmth: Warmth is important. Cold and shivering mean an increased production of CO_2 and an increased demand for oxygen. The clothes must be removed at the earliest moment, for they hold gas and may be dangerous not only to the patient but to those about him; warm covering must however, be provided.

(c) Oxygen: The administration of oxygen in all dyspnoic, cyanotic patients is of vital importance. The administration should be so nearly continuous as possible up to the point of the disappearance of the cyanosis, and should be continually repeated whenever the demand is evident.

(d) Bleeding: In patients who are cyanotic and show engorgement of the venous system, bleeding is indicated. By venesection we combat—

(1) Oedema of the lungs.

(2) The condensation of the blood; for with the abstraction of the polycythæmic blood, fluid is drawn from the lungs and the tissues, and the circulatory medium becomes less viscous.

(3) The overburdening of the right heart.

The bleeding should be early and free, from 2 to 600 c. c.

Bleeding is inadvisable, nay dangerous, in the patient who is pale and gray and in collapse.

If the heart's action be rapid or feeble, bleeding may be preceded by an intramuscular injection, 15 minutes before the venesection, of $\frac{1}{4}$ mg. (gr. $\frac{1}{250}$) digitaline cristallisée Nativelle. This may, if necessary, be repeated once or twice in the next 24 hours, and continued later by the mouth if necessary.

In the early stages, during the period of distressing restlessness and agitation and pulmonary oedema, morphia may be necessary. Its action as a respiratory depressant is believed by some to be dangerous; and the administration of oxygen, if it suffices, is the safest and the best means of quieting the agitation. Where the distress and physical effort associated with the struggles of the patient are great, morphia 0.016 (gr. $\frac{1}{4}$), hypodermically, may be demanded, but at the same time it should be remembered that in collapse, dulling of the respiratory center may turn the scale against the patient.

Treatment of the pale, gray cases with collapse.—Oxygen is here the main aim, and the administration should be practically continuous.

Never bleed these patients. Bleed only those with venous congestion.

Rest, warmth, and oxygen are the mainstays of treatment. Atropine and adrenaline are contraindicated. These drugs place and increased strain on the heart. It is best to abstain from intravenous salt solution injections. The fluid introduced puts an extra burden on the heart, is soon absorbed into the tissues, and may increase the pulmonary oedema. In grave cardiac weakness, preparations of camphor or caffeine may be given hypodermically, and digitalis may be indicated, according to the nature of case.

Relapses.—In any patient who has had pulmonary oedema it may, within the first few days, recur on slight exertion or even without apparent cause, and if there have been any definite symptoms of oedema of the lungs the patient should be kept in bed for a week.

Smoking should be absolutely prohibited and convalescents should not be allowed to smoke in the ward in which these patients lie.

Patients whose symptoms have been mild should, if possible, be put on graduated exercises as soon as they are out of bed, and under military discipline as soon as possible. Mild cases should be back in the line in about two weeks. Severe cases may have to remain in the hospital for three or four weeks and thereafter spend several weeks in a convalescent camp.

Great care should be taken to protect the convalescent from secondary infections. Wherever it is possible beds should be isolated one from another by sheets, as in acute respiratory infections, for secondary bronchitis and broncho-pneumonia are not uncommon and the danger of cross infection should be provided against.

Vesicant gases.—The symptoms, here, are usually delayed from 3 to 24 hours, and dangerous symptoms do not, as a rule, appear for from 24 to 48 hours after exposure, but

pulmonary edema and symptoms similar to those observed in the suffocative cases may occur; moreover, the patient may have had a double exposure to different sorts of gas. All the precautions, therefore, above mentioned should be observed at the outset, but other special steps must be taken.

Disposition of clothes.—Wherever exposure to a vesicant gas is suspected, the use of external warmth should be avoided if the clothes have not previously been removed. The application of heat favors the diffusion of the gas.

Remove the clothes as soon as possible, but protect the patient from exposure during the process.

After removal, the clothes should be sterilized in wet steam for 30 minutes; in dry heat for 15 minutes; exposed to the air for 15 minutes. This may be carried out in the Thresh sterilizer, and may have to be repeated twice, although two or even one treatment may be efficacious. While waiting for sterilization, have the clothes placed outside the quarters, in the open. All who handle the clothes must be protected by respirators and special oiled clothing and gloves.

Removal of the poison from the skin.—The patient should be thoroughly bathed in a warm room in soap and water at the earliest possible moment. Areas which have been specially exposed may first be covered for a few minutes by a paste of 25 to 50 per cent chloride of lime in water and then washed with warm water. Bathing with 0.05 per cent permanganate of potassium is said to be useful.

Treatment of the skin and mucous membranes.—When the skin is dry, erythematous areas may be powdered with subnitrate or subcarbonate of bismuth (oxide of zinc), talcum, or any simple nonirritating powder. Moist and raw surfaces may also be powdered with the same substances or a powder consisting of oxide of zinc, carbonate of magnesia, carbonate of lime, 200 gr.; talcum powder, 400 gr., and protected from the bed clothes by cribs, or covered by a nonabsorbent dressing.

If a moist dressing be preferred, a solution consisting of sodium chloride, 70 gr.; sodium bicarbonate, 150 gr.; water, 5,000 gr. may be used—simply limewater.

Blisters should be carefully attended to. The contents of the vesicles are poisonous and irritating to the surrounding skin; the blisters should, therefore, be opened carefully and the contents taken up with absorbent cotton, which should promptly be burned. Interdigital areas should be washed carefully daily, powdered and bandaged.

Fatty salves, in the early stages, are inadvisable, as any undestroyed poison which remains on the skin may be diffused underneath.

Later, deep and painful burns are much relieved by treatment with ambrine.

The eyes should be irrigated immediately with warm alkaline solutions such as the above mentioned solution of sodium chloride, sodium bicarbonate, and water. After this, some nonirritating oil such as liquid albolene should be instilled. The patient should be kept in a dark room, or the eyes shaded. Compresses soaked in this solution may give comfort in the acute stage. In severe cases, frequent (every 2 to 3 hours) irrigation of the conjunctiva with simple boric solutions (sodii boratis 0.65) (aquæ camphoræ 30), followed by the instillation of liquid albolene, should be carried out.

The nose should be sprayed with a warm alkaline solution (sod. chloride, sod. bicarbonate, and water, as above) and also with liquid albolene, to which a little menthol may be added (such as the preparation known as "Chloretone inhalant").

The mouth should be rinsed with alkaline washes and gargles.

The laryngeal inflammations may be relieved by inhalation of: Menthol 0.65, tinct. benzoini comp. ad, 30, of which 5 c. c. are added to 500 c. c. steaming water.

Secondary respiratory infections.—"Mustard" cases may develop grave secondary bronchitis, with broncho-pneumonia. In the treatment of such instances there is nothing specific. Every precaution should, however, be taken to prevent cross infection. The beds of all patients with purulent bronchitis and broncho-pneumonia should be screened one from another and from their neighbors.

Sequels of gas poisoning.—In soldiers who have been "gassed," especially with phosgene, symptoms similar to those characterizing D. A. H. (effort syndrome) are not uncommon—dyspnoea on exertion, pain in the chest, palpitation, dizziness, fatigue on exertion, disturbed

sleep with dreams, paroxysms of coughing, and even asthmalike attacks. These patients are often polycythemic. Nervous manifestations unassociated with apparent organic lesion are common.

Get these patients out of bed and start carefully graduated exercises, sending them as soon as possible to a special training camp.

"Functional" photophobia and blepharospasm are frequent, but eye shades and colored glasses should be discontinued as soon as the acute inflammatory stage is over. When this has passed, the use of eye drops of a solution of:

Zinci sulphatis.....	0.065-0.13 (gr. I-II)
Acidi borici.....	3.75 (3T)
Aquæ.....	30 (3T)

is said to give relief. If corneal ulcers or iritis, which are not common, be present they must be treated in the usual manner. Threatening though the ocular manifestations may be, recovery is usually complete. Grave damage to the uveal tract is rare. It is important not to overtreat the eyes.

In all cases preserve an optimistic attitude; the great majority of gassed patients recover completely.

Do not let the patients become introspective or "hospitalized." Keep them occupied in mind and body. Get the "mustard" gas cases who have no respiratory involvement out of bed in two or three days if possible. Remove the eye shades as soon as the acute inflammatory stage is over. Send the men out of doors; look out for their employment or amusement, and get them under army discipline as soon as may be. Far too many convalescent "gassed" cases tend to accumulate, uncared for, in base hospitals. The responsibility of the medical officer does not end with the disappearance of the dangerous symptoms. See to it that the patient does not become a psychoneurotic.

Attention to these details may save a considerable wastage of men.

M. W. IRELAND,
Brigadier General, Chief Surgeon.

Circular No. 35.

AMERICAN EXPEDITIONARY FORCES,
France, June 13, 1918.

THE MANAGEMENT OF MENTAL DISEASES AND NEUROSES IN THE AMERICAN EXPEDITIONARY FORCES

Absence of the auxiliary civil facilities that simplify the management of mental cases in the Army in home territory, and the extraordinary incidence of functional nervous diseases in all armies in the present war, have made it necessary to provide special facilities and methods of procedure in the American Expeditionary Forces. These disorders, by their very nature, interfere with the morale and efficiency of troops in war. Their proper management in the hospitals and organizations in which they first come to notice and their wise disposition and reclassification subsequently will not only increase military efficiency, but in the case of war neuroses, will tend to diminish to a considerable extent their incidence.

This circular is issued in order that all medical officers may become familiar with the facilities that have been provided for the diagnosis, transportation, and treatment of soldiers with these disorders. These facilities will be modified from time to time as changing conditions necessitate, but the general plan of management here outlined will be followed:

I. MENTAL CASES (INSANITY, MENTAL DEFICIENCY, OBSERVATION CASES)

(a) *Provisions for prompt diagnosis and early care.*—Tactical divisions: Each tactical division in the American Expeditionary Forces and in the United States is provided with a psychiatrist whose duty it is, under the direction of the division surgeon, to examine all mental cases coming to attention in the division and to make recommendations for their evacuation or other disposition. The psychiatrists will be detailed from the division sanitary personnel. Their specific duties are defined in Circular No. 5, chief surgeon's office, A. E. F.

They will examine enlisted men brought before general courts-martial, as provided by War Department order of March 28, 1918. They will also examine all other military delin-

quents brought to their attention, especially those in whom self-inflicted wounds or malingering is suspected. Except under exceptional circumstances, no cases of this kind will be evacuated to the rear until examined by the division psychiatrists. In the case of prisoners accused of crimes, the maximum punishment of which is death, the division psychiatrist should, whenever practicable, have the assistance of a consultant in psychiatry.

Base hospitals: A neurologist or a psychiatrist has been assigned to each base hospital or group of base hospitals in the same vicinity. This provision makes it possible for mental cases that first come to attention in such hospitals to receive early diagnosis and treatment and prompt evacuation to hospitals provided with special facilities for their care.

(b) *Provisions for hospital care.*—Advance section, Services of Supply: There has been provided in connection with Base Hospital No. 116 a neuropsychiatric department of 72 beds, which will act as a collecting and evacuating point for mental cases from other base hospitals, from tactical divisions, and from training areas.

When observation cases or patients with frank mental disease or defect are recommended by the division surgeon, upon the advice of division psychiatrists, for transfer to this collecting station, the commanding officer of Base Hospital No. 116 will be notified by telegraph or telephone and will thereupon send a sufficient number of attendants to bring such patients to the hospital in safety. It is necessary, in making such requests, to state the number of patients and the amount of supervision that they will require en route. When practicable, the ambulance service to be established in connection with Base Hospital No. 117 will be employed for this purpose. In all such cases, the diagnosis will be "Observation, mental," the type of disease being added in parentheses.

It is very important that mental cases be accompanied by records in which the circumstances under which their condition came to notice are fully stated. It is obvious that, without such information, the medical officers who have the responsibility of dealing with these cases will often have difficulty in arriving at a diagnosis or in making suitable recommendations for their disposition.

Base hospitals in the advance section will transfer to this collecting station all mental cases except those which can readily be retained until sent for by the psychiatric department of one of the base hospitals at a base port, and those in whom complications or other reasons render a transfer undesirable. Effort will be made to provide all base hospitals with several nurses or enlisted men of the Medical Department who have had experience in the care of mental cases. With such attendants it will be unnecessary to place guards in observation or mental wards. Commanding officers will protect these cases from the ridicule to which they are sometimes subjected even in hospitals.

Intermediate section: At least one of the large base hospital centers which it is proposed to establish in this section will ultimately have in connection with it a neuropsychiatric department similar to that at Base Hospital No. 116. Hospitals in this section will, in the meantime, evacuate their mental cases to Base Hospital No. 8 in the manner specified in Paragraph I (c) of this circular.

Base sections Nos. 1 and 2: A psychiatric department, with a capacity of 152 patients, has been provided in connection with Base Hospital No. 8. This and a similar one to be established in connection with a base hospital center in base section No. 2 will provide the chief facilities for the classification and continued care of mental cases in the American Expeditionary Forces.

Base section No. 3: Mental cases among American troops serving with British organizations will be evacuated to England in the same manner as other sick and wounded from the same organizations. In England a neuropsychiatric department will be provided for the reception, continued care, and classification of cases from British clearing hospitals for mental diseases and from other hospitals in Great Britain.

Base section No. 4: Any mental cases coming to notice in this section will be evacuated to base section No. 3.

Base section No. 5: Psychiatric wards will be provided at a base port. These wards will receive only cases which have been classified "class D" at Base Hospital No. 8, and whose condition is such that they can be transported to home territory with the minimum of care and supervision. This ward will receive no other cases, but will provide temporary care for soldiers who are found insane upon their arrival from the United States.

Base sections Nos. 6 and 7: Mental cases arising in these sections will be evacuated to a base hospital at the port of base section No. 2.

French hospitals: Mental cases that have been evacuated from the front into French military hospitals will be transferred as soon as practicable to the most accessible neuropsychiatric department of an American base hospital center.

(c) *Transportation*.—The neuropsychiatric department at Base Hospital No. 116 will send for patients to other base hospitals in the advance section, Services of Supply, and to tactical divisions and training areas as provided in Paragraph I (b) of this circular. The neuropsychiatric departments of base hospital centers to be established in the intermediate section, Services of Supply, will send for patients in the same manner.

The psychiatric departments of Base Hospital No. 8 and the base hospital center in base section No. 2 will send for patients to any base hospital which is nearer to them than to a collecting station.

As mental cases of all degrees of severity can be safely and comfortably provided for at these collecting stations, they will be retained until a sufficient number have accumulated so that they can be evacuated in parties, the attendance being provided by the psychiatric department at the base port to which they are sent. Ordinarily, regular passenger trains will be used; but in special instances and where the number of patients warrants it, transfers will be made in a car set aside for this purpose on an American hospital train destined for a base port to which they are to be sent. In this case, as in all others, attendance will be provided by the psychiatric department receiving the convoy.

Evacuation to home territory of patients classified "class D" will be made in accordance with special arrangement which it is not necessary to outline in this circular.

(d) *Disability boards for mental cases*.—Disability boards for mental cases will be convened at neuropsychiatric departments of base hospital centers and at psychiatric departments at base ports. Other disability boards should not pass upon these cases, but should refer them to one of the points at which such boards are authorized. All mental cases to be transported in France will be given the tentative diagnosis of "observation, mental," except those transported to their final destination on American hospital trains.

Disability boards will be guided by Circular No. 24, chief surgeon's office, 1918, in passing upon mental cases.

II. FUNCTIONAL NERVOUS DISEASES AND CONCUSSION CASES

(a) *General consideration*.—The proper management of these conditions which are commonly included in the designation "shell shock" is regarded by this office as a matter of much importance. This term, which, unfortunately, is being used indiscriminately by medical officers as well as patients, includes a number of different conditions depending upon many different causes and requiring for their successful management several entirely different methods of procedure. Many patients in whom severe concussion symptoms follow being blown up by shells or buried in dugouts can be returned to duty, and it is possible to return a much larger proportion of those cases in which purely psychoneurotic symptoms develop under shell fire or in training, if they are skillfully managed. The return of these cases to their own organizations after a short period of treatment has a very favorable effect in lessening the incidence among their comrades of disorders in the second group mentioned. If, on the other hand, a large proportion of these patients are evacuated indiscriminately to hospitals in the Services of Supply or to home territory, the effect will be to increase their incidence.

For this reason a special hospital for these cases, Base Hospital No. 117, has been established, and an ambulance service has been provided in connection with this hospital by which cases can be received directly from tactical divisions at the front. At this hospital the resources found most useful in the British and French special hospitals for these cases are employed. Success in their treatment depends very largely upon the attitude of medical officers generally toward the special problems in diagnosis and management which they present. For this reason regimental medical officers should guard against making an unfavorable prognosis even in cases presenting severe symptoms.

(b) *Treatment.*—Tactical divisions: The advice of the division psychiatrists should be utilized to the fullest extent in the early treatment of these cases in division sanitary organizations and in the selection of cases for evacuation to hospitals in the Services of Supply. It will be found advisable, whenever practicable, to receive such cases in special wards in one field hospital and to evacuate cases to hospitals in the Services of Supply only upon the recommendation of the division psychiatrist. This officer will advise with regimental medical officers regarding the management of nervous manifestations when they first come to attention at the front.

Hospitals in the Services of Supply in France: It is expected that a very large proportion of these cases will be admitted directly from their organizations to Base Hospital No. 117 and that relatively few, unless complicated by wounds, gassing, or other conditions, will be received in other base hospitals. Other base hospitals will promptly transfer suitable cases to Base Hospital No. 117 except in these instances in which it is thought that they can return directly to duty and those in which the outlook seems so unfavorable, from constitutional neuropathic tendencies or other factors, that their reclassification is probable. Cases in which there is some doubt as to whether an organic or functional disorder is present should be transferred to Base Hospital No. 117. No cases having wounds requiring much surgical attention should be sent to Base Hospital No. 117. All cases in which there is doubt as to the best disposition should be brought to the attention of the consultant in neuropsychiatry for the hospital.

Hospitals in the Services of Supply in England: A special hospital for war neuroses will be provided in England which will be organized and conducted upon the same lines and will perform the same functions as Base Hospital No. 117. American soldiers serving with British organizations will be transferred to this hospital from the British clearing hospital for these cases or from other hospitals in England.

French hospitals: American patients with these disorders in French military hospitals will be evacuated to Base Hospital No. 117 or to the nearest neuropsychiatric department of a base hospital center.

(c) *Disability boards for functional nervous diseases and concussion cases.*—Disability boards for these cases will be convened at Base Hospital No. 117, neuropsychiatric departments of base hospital centers, and psychiatric departments of base hospitals at base ports. No other disability boards should pass upon these cases.

M. W. IRELAND,
Brigadier General, N. A., Chief Surgeon.

Circular No. 36.

AMERICAN EXPEDITIONARY FORCES,
France, June 11, 1918.

Subject: Promotion in the Medical Reserve Corps.

1. The Medical Reserve Corps has not heretofore received promotions so as to fill up the proportions to which the corps is entitled by law, because of the many difficulties which have presented themselves in working out a system which would be just and satisfactory.

2. Great inequalities occurred in the original commissioning of medical reserve officers by which men of mature age and high standing in the medical profession were made junior to others who were younger and of less professional experience. Further inequalities have been created by the promotion in the United States of younger officers who afterwards came to France with the increased rank which had been denied to members of the Medical Reserve Corps of the American Expeditionary Forces.

3. A plan has been, however, now prepared in this office which has met the approval of the commander in chief and which it is desired to put immediately into operation. This plan recognizes that several factors should be considered in determining the rank of a member of the medical profession coming into the Army in time of war to give voluntary service.

(a) The first is age and the length of his professional experience, which constitutes, generally speaking, the asset of greatest value to the Government which he brings into the service.

(b) The second is the length of his active service, which determines his military experience.

(c) The third is the character of his military service, and whether it has been distinguished by unusual self-denial, gallantry, efficiency, or hardships which would entitle the candidate to advancement beyond others of the same professional and military experience. On the other hand, this factor may be one of inefficiency or ill conduct which would in justice demand the withholding of promotion, or even separation from the service.

4. In order to accumulate the data for the determination of these factors in each case, it will be necessary to have commanding officers and senior medical officers furnish recommendations in the case of officers of the Medical Reserve Corps serving under them. An individual report upon a separate sheet of paper should be given in the case of each officer, whether considered deserving of promotion or not, except those under the draft age of 31 years. Officers under the draft age will not be promoted except in special cases where the officer has rendered unusually distinguished service and has been more than a year on active duty. This report should in each case give the following information:

(1) Full name and rank.

(2) Date of birth.

(3) Date of graduation in medicine and institution, if these can be ascertained.

(4) Date when ordered on active duty under Reserve Corps commission.

(5) Previous active military service, if any, either in the United States Army or with the National Guard when called into the United States service.

(6) Character of service of the officer:

(a) Has it been of a satisfactory and creditable character, such as, when his age, professional experience, and length of service being considered, would entitle him to a higher grade; or

(b) Has it been fairly satisfactory in positions not of great responsibility, but not such as would warrant promotion to a higher grade; or

(c) Is the officer, on account of professional ignorance, indolence, bad habits, or moral delinquency of any sort, undesirable for the military service. In this case, as full a statement as is practicable should be made of all the facts throwing light upon the shortcomings of the officer; and it should be stated whether he has been brought before a board of officers under General Order 45, general headquarters, A. E. F., 1918.

5. Copies of this circular and the blank forms for making the reports will be sent by this office to the base surgeons of sections, who will be charged with distributing them to all medical organizations in their sections except the base hospitals, to which the forms will be sent direct in order to save time and clerical labor; also to division surgeons, who will be charged with supplying them to the senior medical officers of all medical units in the divisions. In each case the report will be prepared by the immediate medical superior of the medical reserve officer to be reported upon, and they will be forwarded through the military channels.

M. W. IRELAND,

Brigadier General, M. C., N. A., Chief Surgeon.

FRANCE, June 11, 1918.

FORM FOR REPORT AS TO THE CHARACTER OF SERVICES AND QUALIFICATIONS OF MEDICAL
RESERVE CORPS OFFICERS

1. Full name and rank.....

2. Date of birth.....

3. Medical school from which graduated, with date of graduation.....

4. Date when ordered into active service on Reserve Corps commission.....

5. Previous active military service, either in United States Army or with National Guard in United States service.....

6. Character of service of officer:

(a) Has it been of a satisfactory and creditable character such as, when his age, professional experience and length of service are considered, would entitle him to a higher grade; or

(b) Has it been fairly satisfactory in positions not of great responsibility, but not such as would warrant promotion to a higher grade; or

(c) Is the officer, on account of professional ignorance, indolence, bad habits, or moral delinquency of any sort, undesirable for the military service? In this case, as full a statement as is practicable should be made of all the facts throwing light upon the shortcomings of the officer, in order that he may be brought before a board for the determination of his fitness for the service. Any available evidence in the form of correspondence or documents which is available should be forwarded in such cases.

(State at beginning of answer whether service has been of class A, B, or C, and write remarks thereafter.)

Circular No. 37.

AMERICAN EXPEDITIONARY FORCES,

France, June 22, 1918.

1. *Food and nutrition section.*—Announcement is made of the organization of a food and nutrition section in the division of sanitation, office of the chief surgeon, A. E. F. This section will be located at Dijon, under the supervision of the director of laboratories and infectious diseases, and its functions shall be to inspect, investigate, and make recommendations concerning those factors directly affecting the nutrition of troops of the American Expeditionary Forces. The section is authorized to advise concerning the suitability of rations and dietaries, and all changes or substitutions proposed in rations and dietaries for troops, hospitals, or prison camps; and in cooperation with the Quartermaster Department the section will devise and propose measures for the conservation of food.

2. *Official letters and telegrams.*—Official letters and telegrams should be addressed to the chief surgeon, A. E. F., and not to individual officers or divisions of his office.

3. *Billets or shelter tents.*—The attention of commanding officers of ambulance companies, field hospitals, and other mobile medical units is invited to the fact that Medical Department soldiers attached to these units should be sheltered in the same way as other soldiers at the front, namely, by billets or shelter tents, it not being practicable to issue tentage for the shelter of soldiers at the front. Commanding officers of the above-named organizations will therefore turn in to the nearest quartermaster depot the large pyramidal tents issued to ambulance organizations and field hospitals for the use of enlisted personnel, and such wall tents as are issued for the use of officers not entitled to tentage in the field.

4. *Surgical operations.*—(a) Surgical operations of election for chronic conditions which existed before the war and do not incapacitate for the performance of ordinary duty will not as a rule be performed during periods of military activity, and will only be done in well equipped base or camp hospitals of the American Expeditionary Forces.

(b) Hernias should be operated upon subject to the foregoing restrictions, bearing in mind military convenience and the extent of present or threatened disability.

(c) Operations for varicocele should as a rule not be performed at all.

(d) Removal of tonsils is not to be done, except when marked destruction to respiration exists, or when they are a source of infection in a systemic disease.

(e) Hemorrhoids should be operated upon subject to the restrictions of paragraph 1.

(f) Special instructions for the handling of orthopedic patients are in course of preparation.

5. *Orders involving travel of over 10 persons.*—When orders, involving travel of over 10 persons, are received by the commanding officer of a base hospital or other sanitary formations of the Services of Supply, he should at once notify the railroad transportation officer at his station and should not comply with the order until notified by the railroad transportation officer that a schedule has been arranged.

If no railroad transportation officer is at the point where the movement originates, details of the movement should be wired to the troop bureau of the transportation department at these headquarters, with request that proper arrangements be made.

6. *Proper handling and disposition of slightly wounded men.*—Attention is directed to the importance of early, proper handling and disposition of slightly wounded men in all hospital formations. While the handling of seriously wounded usually entails a greater exercise of technical skill, the claims of the slightly wounded for equal attention may be

overlooked. It must be borne in mind that a neglected or improperly treated slight wound may have serious consequences and cause prolonged hospitalization. Slightly wounded men form the greatest military asset among all those admitted to hospitals, in that their early return to duty can be looked for if properly treated. The tendency in some hospitals is to delegate the care and treatment of slightly wounded men to the medical officers young in experience and skill in surgery.

Without deflecting the full measure of attention to be given to serious cases, surgical personnel at hospitals should be so assigned as to bring skill and attention to bear upon slightly wounded men equal to that given to more serious cases, carrying into effect that principle of military surgery which contemplates the greatest good to the greatest number.

7. *Telegraphic and mail communications.*—All communications, both telegraphic and mail, intended for the chief surgeon, A. E. F., should be addressed to the chief surgeon, A. E. F., Services of Supply, and not general headquarters.

8. *Reports of Y. M. C. A. personnel.*—For all Y. M. C. A. personnel treated in American Expeditionary Forces formations the following information will be sent to the Y. M. C. A. headquarters, 12 Rue D'Agnesseau, Paris: (a) Date of entry to hospital, (b) diagnosis, (c) disposition, (d) date of disposition, (e) any facts pertinent to the further care of the case.

9. *Autopsy reports.*—In the future, all autopsy reports will be made in triplicate. One copy will be sent to the chief surgeon's office, one direct to the central medical laboratory, U. S. A. P. O. No. 721, and one to the commanding officer of the medical unit for which the autopsy is performed.

10. *Disposition of ordnance equipment.*—The attention of commanding officers of hospitals is invited to the fact that all available ordnance equipment is needed, and such equipment should not be allowed to accumulate in hospitals. It should be turned in to a salvage officer when there is one near the hospital, with instructions to ship it to advance ordnance depot No. 1, Is-sur-Tille. If there is no salvage squad in the vicinity of the hospital, it should be shipped by the commanding officer of the hospital direct to advance ordnance depot No. 1, Is-sur-Tille.

11. *Prescriptions for lenses.*—Prescriptions for glasses are being received at the central optical unit in one-eighth diopter, or multiples thereof, which necessitates grinding the one-fourth diopter stock lenses. It has been found by experience that for all practical purposes a correction down to one-fourth of a diopter is sufficient. Hereafter, prescriptions for lenses will not be written in less than one-fourth subdivisions of a diopter.

M. W. IRELAND,

Brigadier General, M. C., N. A. Chief Surgeon.

Circular No. 38.

AMERICAN EXPEDITIONARY FORCES,

France, July 1, 1918.

1. *Class D patients not to be sent to St. Nazaire.*—Class D patients intended for evacuation to the United States via St. Nazaire will be sent to Base Hospital No. 8, at Savenay, and not to St. Nazaire.

2. *Change of circular No. 31.*—Paragraph 3, under "Evacuation of British patients," Circular No. 31, American Expeditionary Force, May 23, 1918, is rescinded, and the following substituted therefor:

(a) To carry out the wishes of the director general, medical service British armies in France, all British patients fit for travel discharged from American base hospitals in France will be ordered to report to D. D. M. S., Rouen, and not to A. D. M. S., Paris. Telegraphic report will be made to D. D. M. S., Rouen, British Expeditionary Force, and at the same time to medical communications, British Expeditionary Force, stating number of patients, time and place of departure, probable time of arrival at Rouen.

(b) The effects of deceased British soldiers should be sent to "The D. A. G., effects branch, general headquarters, third Echelon, British Expeditionary Force," and public clothing and equipment to the commanding officer, ordnance base, British Expeditionary Force. Unless otherwise directed, commanding officers of hospitals, in returning British officers and soldiers from hospital to place directed, will furnish their transportation on "Order of transport, model A," indicating on it in red ink "British Expeditionary Force."

(c) The provisions of the first sentence under "French soldiers in American sanitary formations," Circular No. 31, A. E. F., May 23, 1918, do not apply to those hospitals where a definite number of beds has been reserved for the reception of French patients, and when this number has not been exceeded.

3. *Disposition of sick and wounded of American Expeditionary Forces on duty with British Expeditionary Force.*—In accordance with agreement of May 6, 1918, between the British War Office and representatives of the American Expeditionary Forces, sick and wounded of American Expeditionary Force troops on duty with the British Expeditionary Force are to be evacuated into British Expeditionary Force hospitals. As far as practicable, this evacuation will be into hospitals staffed by American sanitary units.

4. *Instructions pertaining to evacuation of patients to United States.*—(a) Surgeons of base sections will be responsible for and regulate the evacuation of class D cases to the United States from hospitals at base ports. They will keep informed as to the number and types of cases awaiting evacuation, the dates of departure, and carrying capacity of transports and hospital ships, in order that there may be no delay in the movement of sick and wounded. They will see that transport surgeons receive lists of patients and the necessary papers pertaining to the cases which are to be sent to the United States, (see instructions on "Field medical card," and par. 7, Sec. VI, p. 9, and par. 1, Sec. VIII, p. 10, "Sick and wounded reports for the A. E. F."), including the classification of mental and other cases. They will obtain from transport surgeons receipts for patients and the papers pertaining thereto, as well as receipts for valuables and effects of insane and helpless cases.

(b) When patients of class D collect at any base port in such numbers that they can not be properly cared for, and the facilities for evacuating them to the United States by transport are insufficient, the base surgeon will send such cases as deemed advisable to another base section, in accordance with such agreement as is made with the base surgeon of that section.

(c) Surgeons of base sections, on request of surgeons of other base sections, will make the necessary preparations for the reception and embarkation of patients sent to their respective ports with the view to evacuation to the United States. They will also assist surgeons of other base sections to obtain sufficient information, so as to enable them to send patients at the proper time for embarkation.

(d) Under the provisions of article 1, of an agreement entered into by the Secretaries of War and Navy, March 28, 1918, the Navy is charged with the care of sick and wounded of the Army sent from France or England to the United States, except those shipped on Army transports, but, the Army, on request of the Navy, will render such assistance in personnel and material as may be necessary. It will readily be seen that it would be impossible at the present time to estimate, for the different ports, the number of personnel and character and amount of material that the Navy might require from the Army under the provisions of the above article, but in order that the Army may be able to carry out its part of the contract as far as possible, the following will be observed:

a. Base surgeons will investigate and determine the character and amount of material (referred to under art. 1, par. C, of the above-mentioned agreement) that will likely be required by transports entering their respective ports, and they will make timely requisitions therefor.

b. Whenever the Navy requests personnel under the provisions of the above-mentioned agreement, base surgeons will recommend to their respective base commanders, for detail with the Navy, such assistance as is available in the different sanitary organizations of their respective base sections, without depleting the efficiency of any organization to such an extent that its required work can not be satisfactorily accomplished. When such men are detailed with the Navy, a telegraphic report will be sent to the chief surgeon, A. E. F., stating all particulars, in order that the men may be replaced as soon as practicable.

c. Should the personnel or material requested by the Navy not be available at the time, base surgeons will take proper steps to retain ashore such cases as the transport surgeons would be unable to properly care for.

(e) When class D cases are evacuated to the United States on any vessel other than naval transports or naval hospital ships, the surgeons of the base section from which the vessel sails will, before patients are taken aboard, make the necessary preparations for proper medical attention, supplies, and personnel for their care en route.

(f) Surgeons of base sections will submit to this office lists of all patients evacuated to the United States from the ports in their sections. In addition to giving name, rank, organization, and diagnosis, the name of the ship will be stated, with a numerical summary outlined as follows: Sitting cases; lying cases (insane requiring restraint; other mental diseases); sick (tuberculosis; all others); wounded (received in action; all other injuries).

5. *Instructions pertaining to prompt action of disability boards and early disposition of cases classified.*—The attention of commanding officers of hospitals is called particularly to the necessity for prompt action of disability boards, and for early disposition of cases that have been classified. In order to determine the length of time that cases recommended to disability boards for classification remain in hospital without being acted upon, commanding officers of base hospitals will submit to the chief surgeon, A. E. F., Services of Supply, a weekly report of all cases which have been recommended for the action of disability boards, and which remain in hospital for two weeks without completion of board proceedings. This report will be forwarded every Saturday, and will show in each case the name, diagnosis, date of admission to hospital, date on which the case was recommended to be sent before the board, and reason for delay in classification. This report will also show in each case the name, diagnosis, and date of recommendation of disability boards, of all men who have been classified by boards and who have not been disposed of within two weeks after the boards' recommendation.

6. *Instructions to disability boards in regard to classification of mental cases at base ports.*—

(a) For the information and guidance of surgeons of base sections, surgeons on transports, liners, and hospital ships, disability boards at hospitals at base ports will classify all mental cases destined for transfer to the United States into the following groups, making entry on board proceedings in each case: "Close supervision"; "ordinary supervision"; "no special supervision."

(b) Cases designated for "close supervision" should be placed in compartments or rooms on shipboard, being constantly guarded by reliable attendants, and not allowed to go on deck.

(c) Cases designated for "ordinary supervision" can be placed in the sick bay, with the same supervision as is given to ordinary sick and wounded.

(d) Cases designated for "no special supervision" can sleep in ordinary bunks.

Many cases of feeble-mindedness and nondepressed psychoneurotics may fall under this class.

(e) The greatest care must be exercised in the classification of mental cases, and where doubt exists in any case, the proceedings of the board will show the entry "close supervision".

7. *Letter from the Surgeon General of the Army.*—The following letter from the Surgeon General of the Army is quoted for the guidance of the medical officers of the American Expeditionary Forces, and the information called for will be entered on the sick and wounded card whenever known:

All medical officers are requested in the future to give the name of the causative organism in addition to the diagnosis of the kind of pneumonia and the type of pneumococcus whenever known.

Thus, pneumonia, lobar, should, if practicable be reported as:

- Pneumonia, lobar, pneumococcus, type 1.
- Pneumonia, lobar, pneumococcus, type 2.
- Pneumonia, lobar, pneumococcus, type 3.
- Pneumonia, lobar, pneumococcus, type 3.
- Pneumonia, lobar, pneumococcus, type 4.
- Pneumonia, lobar, pneumococcus, type unclassified.

Also broncho-pneumonia should, if practicable, be reported as:

- Broncho-pneumonia, pneumococcus, type 1.
- Broncho-pneumonia, pneumococcus, type 2.
- Broncho-pneumonia, pneumococcus, type 3.
- Broncho-pneumonia, pneumococcus, type 4.
- Broncho-pneumonia, pneumococcus, type unclassified.
- Broncho-pneumonia, streptococcus, hæmolyticus.
- Broncho-pneumonia, streptococcus, other types.
- Broncho-pneumonia, streptococcus, unclassified.
- Broncho-pneumonia, other organisms, unclassified.

S. The new plan of promotion in the Medical Reserve Corps and Dental Reserve Corps.

The following letter has been received from the adjutant general, A. E. F., which explains clearly the recently approved plan for promotion of the medical reserve officers serving with the American Expeditionary Forces. It has also been extended to the Dental Reserve Corps, and the Surgeon General has been requested to adopt it for these corps in the United States. The corrective promotions authorized in the first paragraph will be made as rapidly as the reports called for by Circular 36 are received, and then promotions will be made according to the roster. Precedence in the roster will be determined by age and length of service, except that a value will also be given for distinguished service, including wounds and decorations received and mention for conspicuous gallantry:

GENERAL HEADQUARTERS,
AMERICAN EXPEDITIONARY FORCES.

From: The adjutant general,
To: The chief surgeon, A. E. F. (through C. G., S. O. S.)
Subject: Promotions.

1. Referring to your memorandum of May 7, 1918, regarding promotion of Medical Reserve Corps officers, you will submit recommendations for promotions to the grade of major of all medical reserve officers above the age of 40, and to the grade of captain of all the lieutenants above the age of 35, whom you may desire to recommend.

2. The following will be considered the policy that will govern in regard to the promotion of officers of the Medical Reserve Corps in the American Expeditionary Forces:

Policy governing promotion of medical reserve officer.—(a) All officers of the Medical Corps in Europe will be placed on a roster according to age in each grade. An officer's age will be determined by his actual age plus four months for each month of service.

(b) All lieutenants whose actual age is above 31, and who have completed one year's service, shall be eligible for recommendation for promotion to captain.

(c) Promotion in general will be according to seniority, as determined by these rosters.

(d) Taking the number of first lieutenants of the Medical Reserve Corps in the American Expeditionary Forces at any time as a basis, the number of officers in grade of captain and major shall not be greater than that authorized by the proportion of one lieutenant to three and nine-tenths captains to one and seven-tenths majors (approximately the proportion between the same grades in the regular Medical Corps at the time of the passage of the medical reserve law).

(e) Recommendation on the part of the military superior of each officer, with a statement that his services have been satisfactory, will be required in each case of recommendation for promotion.

3. The policy with regard to promotion of officers in the Dental Reserve Corps shall be the same as that outlined above for the officers of the Medical Reserve Corps. The chief surgeon is authorized to forward at once any recommendations for promotions which he believes should be made for the purpose of rectifying inequalities in grade due to mistakes in original appointments.

By command of General Pershing:

(Signed)

W. P. BARNETT, *Adjutant General.*

9. *Oxygen tanks.*—The necessity of keeping tanks containing oxygen under covered storage as much as possible is pointed out. Excessive heat causes the plug in the safety valve to be blown out, thereby emptying the tank.

10. *Appliances for fire protection.*—Requests for apparatus of this character should hereafter be made direct to the chief of the bureau of fire prevention, these headquarters, by separate requisition. These items should not be included in requisitions made on the medical supply depots.

M. W. IRELAND,
Brigadier General, M. C., N. A., Chief Surgeon.

Circular No. 39.

AMERICAN EXPEDITIONARY FORCES,
France, July 12, 1918.

LIGHT DIETS IN BASE HOSPITALS

1. The following menus for hospital light diets are sent out as suggestions for the guidance of mess officers. They are based upon a series prepared for use in a base hospital in the United States which proved by experience to work satisfactorily at that place. The

same menus may be repeated each week indefinitely, as any one man is seldom on light diet for more than two weeks. It is probable that the price of some of the articles mentioned may be prohibitive and that some others may be unobtainable. Substitutes will, of course, be made in such instances.

2. By this system the mess officer knows in advance what items will be required and can take measures to keep his stock complete.

3. In preparing menus from Table 2 it should be borne in mind that the total number of calories for each diet should be between 2,000 and 2,500. "Cup" has the same significance in all tables.

4. It is believed that menus prepared from either Table 1 or Table 2 will conform to the practices of the best civil hospitals in the United States.

TABLE I.—*Menus for light diets for one week*

NOTE.—In these menus "cup" means approximately one-half pint of material prepared ready to serve. The "slices of bread" refer to those of the 1-pound loaf or to the half slices of the large Army loaf.

SUNDAY		MONDAY—continued	
Breakfast:	Calories	Supper:	Calories
1 orange, or equivalent in fresh fruit.....	75	1 cup custard.....	300
1 cup cornmeal mush with sugar and milk.....	200	1 cup rice with milk and sugar.....	200
2 slices bread with butter...	175	$\frac{3}{4}$ cup stewed apricots....	250
1 cup coffee, half milk.....	200	2 slices bread with butter...	175
	650		925
Dinner:		Total.....	2, 330
Chicken fricassee, medium service.....	150		
1 baked potato, medium size.....	150		
2 slices bread with butter..	175		
1 cup tapioca pudding.....	250		
1 cup cocoa, half milk.....	240		
	965		
Supper:			
1 soft-boiled egg.....	80		
1 cup Farina with sugar and milk.....	250		
$\frac{3}{4}$ cup stewed peaches.....	250		
2 slices bread with butter...	175		
1 cup coffee.....			
	755		775
Total.....	2, 370		
MONDAY		TUESDAY	
Breakfast:		Breakfast:	
$\frac{3}{4}$ cup stewed prunes.....	250	1 baked apple.....	200
1 cup oatmeal with sugar and milk.....	200	1 cup Farina with sugar and milk.....	200
2 slices bread with butter...	175	2 slices bread with butter...	175
1 cup coffee, half milk.....	200	1 cup coffee, half milk.....	200
	825		775
Dinner:		Dinner:	
1 cup chicken soup.....	100	1 cup creamed chipped beef..	200
2 soda crackers.....	50	2 slices bread with butter...	175
1 poached egg.....	80	$\frac{1}{2}$ cup ice cream.....	225
$\frac{1}{2}$ baked sweet potato.....	150	1 cup cocoa, half milk.....	240
1 cup jelly.....	200		840
1 cup coffee.....			
	580		
		Supper:	
		1 poached egg on toast....	125
		1 cup hominy with sugar and milk.....	250
		2 slices bread with butter...	175
		$\frac{3}{4}$ cup stewed pears.....	125
			675
		Total.....	2, 290
		WEDNESDAY	
		Breakfast:	
		2 slices pineapple.....	200
		1 cup oatmeal with milk and sugar.....	200
		2 slices buttered toast.....	175
		1 cup coffee, half milk.....	200
			775

WEDNESDAY—continued

Dinner:	Calories
Chicken fricassee, medium service.....	150
1 medium baked potato....	150
2 slices bread with butter....	175
1 cup bread pudding.....	250
1 cup cocoa, half milk.....	240
	<hr/> 965
Supper:	
1 soft-boiled egg.....	80
1 cup rice with milk and sugar.....	200
2 slices bread with butter....	175
1 orange.....	75
	<hr/> 530
Total.....	<hr/> 2, 270

THURSDAY

Breakfast:	
$\frac{3}{4}$ cup stewed prunes....	230
1 cup hominy with milk and sugar.....	250
2 rolls with butter.....	175
1 cup coffee.....	<hr/> 655
Dinner:	
1 cup chicken broth with croutons.....	100
1 egg as omelet.....	80
$\frac{1}{2}$ baked sweet potato....	150
1 cup Farina pudding....	250
1 cup coffee.....	<hr/> 755
Supper:	
1 cup tomato spaghetti....	100
2 slices bread with butter....	175
2 slices pineapple.....	200
1 cup cocoa, half milk....	240
	<hr/> 715
Total.....	<hr/> 2, 125

FRIDAY

Breakfast:	
1 orange, or equivalent in fresh fruit.....	75
1 cup oatmeal with milk and sugar.....	200

FRIDAY—continued

Breakfast—Continued.	Calories
2 slices buttered toast....	175
1 cup coffee, half milk....	200
	<hr/> 650
Dinner:	
1 cup creamed codfish....	200
2 soda biscuits.....	50
2 slices bread with butter....	175
1 cup tapioca pudding....	250
1 cup cocoa, half milk....	240
	<hr/> 915
Supper:	
1 soft-boiled egg.....	80
1 cup Farina with milk and sugar.....	200
2 slices buttered toast....	175
$\frac{3}{4}$ cup stewed peaches....	250
	<hr/> 705
Total.....	<hr/> 2, 270

SATURDAY

Breakfast:	
1 baked apple.....	200
1 cup Farina with sugar and milk.....	200
2 rolls with butter.....	175
1 cup coffee, half milk....	200
	<hr/> 775
Dinner:	
1 egg as omelet.....	80
1 medium baked potato....	150
1 cup creamed carrots....	100
2 slices bread with butter....	175
1 cup junket.....	150
1 cup cocoa, half milk....	240
	<hr/> 895
Supper:	
1 poached egg on toast....	125
1 cup corn meal mush with milk and sugar.....	200
2 slices buttered toast....	175
$\frac{2}{3}$ cup apple sauce.....	150
	<hr/> 650
Total.....	<hr/> 2, 320

TABLE II.—For preparation of menus for light hospital diet

BREAFAST

Take one		Take one	Take one	Take one	Take one	Take one
DINNER						
	Take one ¹	Take one	Take one ²	Take one	Take one ³	Take one
SUPPER						
Take one	Take one marked "S."	Vegetables		Take one		Take one
Cereals	Meats and meat substitutes	High starch	Green	Bread and butter	Soups	Desserts
Rice. Oatmeal. Farina. Hominy.	Eggs (S). Chicken. Fish. Beef or mutton. Chopped beef. Macaroni and spaghetti with tomatoes serves for both meat and vegetables (S).	Baked white potatoes. Baked sweet potatoes.	Spinach. Lettuce. Tomatoes. Carrots. Green peas.	Liberty. Rye. White. Graham. Whole wheat. Taro. Rolls. Crackers. ⁴	Beef soup. Beef broth. Chicken soup. Chicken broth. Noodle soup. Vegetable. ⁵ Beans. Brooder. Bouillon.	Custard. Ice cream. Gelatin jellies. Puddings. Fruit cake. Tapioca. Custard. Biscuits. Fruit bread.
						Fruits
						Milk. Coffee. Cocoa. Tea.
						Raw: Apples. Oranges. Baked apples. Canned apple. Fresh: Apples. Cherries. Peaches. Pears. Plums. Dried, stewed, ⁶ Apples. Apricots. Peaches. Prunes.

4 Omit this item if thick soup is served.

2 Omit this item if soup is served.

³ Omit this item if green vegetable is served.

⁴ Not to be served to replace bread, but with soups. For many cases should be strained before serving.

Do not serve more than one dried fruit on any one day.

DO NOT serve more than one drink on any one day.

TABLE III.—*Caloric values of small quantities of foods listed in Table II as prepared ready to serve*

[Note that these values can, in the nature of the case, be only approximate. They should, however, be of some assistance in helping the mess officer or dietitian to approximate the proper value for the day's rations]

Cereals:	Calories	Desserts:	Calories
1 cup of cereal with milk and sugar-----	200	1 cup custard-----	300
1 egg-----	80	1 cup ice cream-----	300
Meats:		1 cup gelatine jelly-----	200
1 cup creamed chipped beef or 1 cup creamed codfish---	200	1 cup pudding-----	250
1 cup creamed chicken-----	400	Fruits, raw:	
Beef, mutton, or chicken, small service-----	100	1 apple, large-----	100
Vegetables:		1 orange, large-----	100
1 cup tomato macaroni-----	100	Baked, 1 apple, large, with sugar--	200
1 medium potato, white-----	100	Canned or stewed fresh fruit:	
1 medium potato, sweet-----	200	1 cup apple sauce-----	250
1 cup tomato, canned spinach, or lettuce-----	50	3 large halves apricots with juice-----	100
1 cup creamed carrots-----	100	1 slice pineapple with juice-----	100
1 cup creamed peas-----	225	3 halves pears with juice-----	100
Bread, 1 slice, or 1 roll, or ½ slice of Army loaf-----	50	1 cup cherries (stewed)-----	100
Butter, 1 service (40 to pound)---	85	1 cup stewed dried fruit-----	400
Soups:		Drinks:	
1 cup thin soup-----	50	1 pint milk-----	800
1 cup thick soup-----	100-200	1 cup cocoa-----	240
		1 cup coffee, half milk-----	200

M. W. IRELAND,
Brigadier General, M. C., N. A., Chief Surgeon.

Circular No. 40.

AMERICAN EXPEDITIONARY FORCES,
France, July 20, 1918.

1. Circular No. 2, office chief surgeon, A. E. F., dated general headquarters, A. E. F., November, 1917, is amended in so far as it relates to the director of laboratories, A. E. F.

2. A division of the office of the chief surgeon, A. E. F., is hereby created, to be known as the division of laboratories and infectious diseases. This division will be an integral part of the office of the chief surgeon, A. E. F., and will be responsible to him through the chief of the division of sanitation. The central organization of this division will consist of a director and the necessary number of assistants. The office of this division will be located in the city in which the central medical department laboratory, A. E. F., has been established (A. P. O. No. 721). Col. J. T. Siler, M. C., N. A., is designated as the director of the division and the following-named officers are designated as his assistants: Lieut. Col. George B. Foster, jr., M. C., N. A., assistant to director section of laboratories; Maj. R. P. Strong, M. R. C., assistant to director section of infectious diseases; Maj. Wm. J. Elser, M. R. C., assistant to director section of laboratories; Maj. Hans Zinsser, M. R. C., assistant to director section of infectious diseases; Maj. P. A. Shaffer, S. C., assistant to director section of food and nutrition; Maj. Louis B. Wilson, M. R. C., assistant to director section of laboratories; Capt. Ward J. MacNeal, M. R. C., assistant to director section of laboratories.

3. This division is charged with the following general duties:

Section of laboratories.—(a) Representative of the chief surgeon in all matters relating to the laboratory service.

(b) Organization and general supervision of all laboratories and the assignment of special personnel.

(c) Advisor to the supply division, chief surgeon's office, in the purchase and distribution of laboratory equipment and supplies.

(d) Publication of circulars relating to standardization of technical methods; collection of specimens and other matters of technical interest to the laboratory service.

(e) Collection and distribution of literature relating to practical and definite advances in laboratory methods.

(f) Collection and compilation of statistics on routine and special technical work done in laboratories.

(g) Instruction of Medical Department personnel in general and special laboratory technique.

(h) Distribution and replenishment of transportable laboratory equipment.

(i) Cooperation and coordination with the Chemical Warfare Service, A. E. F., in the supply of personnel and equipment.

(j) Supervision of the collection of museum specimens and photographic records of Medical Department activities.

Section of infectious diseases.—(a) Advisor of the chief surgeon in matters relating to the prevention and control of transmissible diseases.

(b) Collection and distribution of literature and preparation of circulars relating to methods of prevention and control of transmissible diseases.

(c) General supervision of laboratory research.

(d) Advisory supervision of all activities looking to the control of transmissible diseases including direct liaison with division surgeon.

(e) Assignment of specially trained personnel and equipment for the investigation of epidemics or threatened epidemics.

(f) Experimental investigation of suggested prophylactic methods for the prevention of infectious diseases and recommendations relative to their general adoption.

(g) Collection of epidemiological data on infectious diseases.

(h) Cooperation and coordination with the water supply service, A. E. F., in the supervision and control of water supplies.

Section of food and nutrition.—(a) Representing the chief surgeon in matters affecting the nutrition of the troops.

(b) Investigating Army food requirements and consumption.

(c) Acting in an advisory capacity in the formulation of rations and dietaries for the American Expeditionary Forces.

(d) Inspecting food supplies and mess conditions with troops, hospitals, and prison camps.

(e) Giving instruction in food inspection and handling, mess management, and other measures for the maintenance of nutrition and the conservation of food.

4. The laboratories for the American Expeditionary Forces will be of two general types—stationary and transportable. The stationary laboratories will include the central Medical Department laboratory, base laboratories for the sections of the Services of Supply and for selected districts where necessary, Army laboratories where necessary, base hospital laboratories for individual base hospitals, base laboratories for base hospital centers, and laboratories for camp hospitals.

Transportable laboratories will be organized for evacuation and mobile hospitals and for divisions. Their equipment will consist of standardized expandable units in chests, and their personnel will be specially trained for the duties which they will perform.

5. Instructions concerning the laboratory service of general interest to all Medical Department units functioning with the American Expeditionary Forces will be issued in circulars from this office.

6. The director of the division of laboratories and infectious diseases is authorized to issue special letters and circulars of instruction governing the organization and activities of this division.

M. W. IRELAND,

Brigadier General, M. C., N. A., Chief Surgeon.

Circular No. 41.

AMERICAN EXPEDITIONARY FORCES,
France, July 22, 1918.

1. *Reports and returns.*—Commanding officers of base hospitals will forward reports and returns relating to matters named below through the commanding officer of the hospital center, and direct to the office of the chief surgeon, if the base hospital is not included in a hospital center: Hospital fund statements; sanitary reports; personnel reports; return of enlisted force, Medical Department; report of epidemic diseases; hospital construction and repair.

Commanding officers of hospital centers will take appropriate action upon sanitary, epidemic diseases, and hospital construction and repair reports. The other reports named will be forwarded without action.

Reports of sick and wounded and weekly reports of venereal disease will be forwarded by commanding officers of each base hospital direct to the office of the chief surgeon.

Copies of epidemic and of venereal-disease reports will be furnished to the surgeon of the section in which the base hospital is located.

2. *Gratuities to cooks.*—In compliance with decision of the Judge Advocate General (40, 200 J. A. G., October 13, 1916), effective August 1, no gratuities from the hospital fund will be paid to soldiers of the Medical Department holding the statutory grade of cook. Gratuities paid under authority obtained, both while in the United States and on duty with the American Expeditionary Forces, will be discontinued.

3. *Students.*—Information has been received from the United States that it is not the policy of the War Department to approve the application of any enlisted men for return from overseas to the United States for the purpose of entering educational institutions. This policy applies to medical, dental, and veterinary students.

4. *Tobacco.*—The attention of commanding officers of hospitals is invited to the fact that tobacco has been added to the ration, and it becomes the obligation of the mess officer to furnish it to such patients in hospital as desire to smoke and are authorized to do so. The commutation value of the ration has not been increased on this account, but is believed to be ample, if the proper steps are taken to secure good mess administration and prevent waste, to stand this additional expenditure.

5. *Salvarsan (arsenobenzol).*—On account of difficulties which have occurred in alkalizing and administering this drug under war conditions, the chief surgeon has directed that its issue be confined to the base hospitals, all of which have the proper equipment and technique for its administration. Novarsenobenzol will be supplied to all other hospitals and units, and it alone will be issued after the exhaustion of the present stock of arsenobenzol.

6. *Clinical records.*—Clinical records, temperature charts, and other detailed descriptions of treatment will not be forwarded with monthly report of sick and wounded, by any hospital. They are hospital records and will be retained as such.

7. *Property accountability.*—The attention of all medical officers, and especially those who are accountable for medical property, is called to the following cable received at general headquarters, A. E. F., June 12, 1918:
PERSHING, AMEXFORCE:

Paragraph 4. Medical officers returning to United States should be provided with certificates of nonindebtedness to the Government.

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8. *Religion.*—The religion of every patient admitted to a hospital ward should, as soon as practicable, be ascertained by the ward medical officers and appropriate entry thereof made on the patient's field medical card, such as Roman Catholic, Protestant, Jewish, etc.

9. *Change in report of epidemic diseases.*—Section XII of Sick and Wounded Reports, effective June 15, 1918, calls for telegraphic or telephonic report of measles and German measles. Report by wire of these two diseases is considered unnecessary, and report by mail will be substituted.

10. *Requisitions for antigas clothing and gas masks.*—These items have been included in some requisitions for medical supplies made upon advance medical supply depot No. 1.

In accordance with General Order 53, general headquarters, 1917, the same are supplied by the Chemical Warfare Service, A. E. F., and should not be included in requisitions for medical supplies.

11. *Heating stoves.*—The commanding officers of all base hospitals except type A (newly constructed hospitals), camp hospitals, convalescent hospitals, and evacuation hospitals will immediately submit to the chief quartermaster, through this office, requisitions for the number of large, medium, and small size heating stoves required in addition to the ones now on hand; also the requisite number of joints of pipe and elbows, with the necessary feet of stove wire.

In arriving at the required numbers of each of these articles, commanding officers must continually bear in mind the exceeding difficulty with which all articles of this nature are secured, also the likelihood of extreme scarcity of fuel during the coming winter. In this connection, stoves should be so located as to reduce the number of pipes and elbows necessary to a minimum.

12. *Expenditures.*—Vouchers submitted for purchases made under the authority of paragraph 4, Circular No. 15, office of chief surgeon, line of communications, which reads as follows: "The commanding officer of each base hospital is authorized to expend from Medical Department funds a sum not to exceed \$100 per month for the purchase of equipment and supplies properly chargeable under regulations against such funds," will bear the signature of the commanding officer of the hospital either as a certifying officer or as the approving officer.

This allowance will be confined to the emergency purchase of articles on the supply table and in amounts sufficient only to bridge over the period pending the receipt of supplies from the depot. Supplies furnished by other departments will not be purchased, as such are not properly chargeable against Medical Department appropriations. Authority to purchase items which have been erased from the medical supply table or of any item in an amount in excess of the immediate needs must be approved either by this office or the section surgeon.

The reserve of medical supplies is now such that requisitions based upon future requirements can be filled, and many emergency purchases or requisitions can now be taken as evidence of poor administration of the supply department of the hospital.

13. *Papers for publication.*—The attention of all medical officers is called to the following memorandum which has been received from the Surgeon General. Papers for publication should be sent through the office of the chief surgeon:

Attention is called to the memorandum quoted below, which was issued March 27, 1918. In many instances paragraph 3 has been overlooked. It is essential that this office receive in duplicate all professional papers submitted for authority to publish:

"1. Attention of medical officers is directed to the provisions of paragraph 423, M. M. D. Medical officers will not publish professional papers requiring reference to official records or to experience gained in the discharge of their duties without the previous authority of the Surgeon General.

"2. Numerous scientific papers written by officers of the Medical Department have recently appeared in the medical press without specific authority from this office. This practice will be discontinued, and the above regulations will be strictly complied with.

"3. Officers desiring the publication of professional papers will submit two copies to the Surgeon General, with request for permission to publish same. Upon approval, a copy will be forwarded to the journal designated by the officer for publication."

M. W. IRELAND,
Brigadier General M. C., N. A., Chief Surgeon.

Circular No. 42:

AMERICAN EXPEDITIONARY FORCES,
France, July 27, 1918.

COLLECTION OF MUSEUM MATERIAL FOR MEDICAL EDUCATION AND RESEARCH

1. *Object.*—This circular is for the information of those branches of the service whose cooperation and assistance are necessary to enable the Army Medical Museum to discharge its duty of collecting all those things which may be used for medical education and research, or which may be of historic interest. This material will consist of pathologic specimens,

bacteria, animal parasites, missiles, armor, instruments, apparatus, casts, models, paintings, drawings, diagrams, charts, statistical tables, cinema films, photographs, radiographs, lantern slides, and other things pertaining to the preservation of the health and the prevention and treatment of the diseases of United States soldiers, or the history of the Medical Department of the Army.

2. *Scope*.—In France all collections will be limited to those things which can not be obtained readily in the United States, or which are necessary for study in the American Expeditionary Forces. More specifically those will relate principally to war wounds, especially lesions of bones and vital organs, gas poisoning, trench foot, gas gangrene, traumatic and "shell" shock, to infections and parasitic diseases of special menace to the American Expeditionary Forces, and to material of historic interest. Other material may be included if obviously desirable. It is requested that all medical officers in the American Expeditionary Forces cognizant of desirable museum material which they are not in position to direct into proper collection channels, should notify the director of laboratories, A. E. F. (museum unit), A. P. O. 721.

3. *Responsibility*.—It is the duty of each medical officer in the American Expeditionary Forces to direct into proper channels all such desirable material coming to his notice. In each medical unit the pathologist, or, in his absence, some other medical officer, will be responsible for the collection, preservation, and shipment of all such material obtainable in the unit.

4. *Use in American Expeditionary Forces*.—Collected material required for investigation in the American Expeditionary Forces will be shipped as early and as directly as possible to the groups of officers conducting the investigations in such manner and quantity as they may request through the director of laboratories, A. E. F. After serving the needs of the immediate investigation, this material, if still of value, will be preserved for use elsewhere.

Requests for material required for teaching in the American Expeditionary Forces should be made to the director of laboratories, A. E. F., who will direct from what source it shall be supplied.

5. *Concentration points*.—All other collected material will be shipped without unnecessary delay directly to concentration points as follows:

(a) To the central Medical Department laboratory from all hospitals in the southeastern portion of the zone of advance and from other hospitals to which the central Medical Department laboratory is most readily accessible.

(b) To American Red Cross Military Hospital No. 2 from all hospitals in the middle section of the zone of advance to which it is most readily accessible.

(c) To United States Base Hospital No. 4 (British Expeditionary Force No. 9 General Hospital) from all hospitals in the northern portion of the zone of advance to which it is most readily accessible.

(d) To United States base laboratory of base section No. 1 or to United States Base laboratory of base section No. 2 from all hospitals to which either of the above points is most readily accessible.

The local railway transport officer should be consulted as to the most accessible point for concentration of packages at the time shipment is to be made.

6. *Final disposition*.—At the concentration points the museum unit will take charge of the further preparation of all material and its shipment to the Army Medical Museum. There it will be catalogued and such portions of it as are necessary immediately redistributed as loans in accordance with a recent decision of the Surgeon General's office, as follows:

(a) Teaching material to United States Army schools for medical officers.

(b) Teaching and certain research material to the under graduate medical schools of the United States (all of which are now under the supervision of the Surgeon General's office.)

(c) All historic and surplus material will be held in the Army Medical Museum for local use or further loans.

7. *Pathologic specimens*.—All pathologic specimens suggested in paragraph 2 from both operations and autopsies should be preserved as follows:

(a) Gross specimens: These should be dissected enough to disclose the character of the lesion and to permit proper fixation. The surface blood should be rapidly washed off with weak formalin (1 per cent or previously used). Each should have securely attached to it

a tag of starched cloth or thick tough paper on which is heavily written in black lead pencil or typewriting the name, rank, and organization of the patient, the anatomical name of the specimen, the diagnosis of the lesion, the hospital number, the serial number of the specimen (if autopsy material, the autopsy number), and the date of collection. Each specimen should be fixed, and preserved until shipped, in five to ten times its volume of Kaiserling No. 1 solution, the formula of which is as follows:

Potassium nitrate, 15 grams.

Potassium acetate, 30 grams.

Formalin, 200 c.c.

Water, 1,000 c.c.

These materials may be requisitioned.

Sodium salts may be used instead of potassium. If materials for other methods of color preservation are at hand, they may be used, but the specimens kept separate from others in shipping. If no salts are obtainable, 10 per cent formalin may be used. Hollow organs, large intestines, etc., should be filled with the solution to their normal size and caliber. Where time permits, the vessels of large specimens should be injected with the solution.

The solution fixes very rapidly and rigidly, so that it is necessary to use care when specimens are placed in it that they are not deformed by pressure. Soft organs (brains, lungs, etc.) which may be injured by pressure should be fixed in individual containers (jars, granite-ware pails, or pans, kegs, etc.). Other tissues may be fixed, several together, in tubs, barrels, casks, etc.

Specimens should not be placed in containers in contact with metal nor in new wooden vessels the walls of which may contain tannin. If new wooden vessels are used they should be coated inside with paraffin. Large containers—earthenware jars, barrels, casks, etc.—should be obtained locally. Wide-mouth bottles and small specimen jars may be obtained by requisition.

After preliminary fixation, the specimens should be changed at least once to fresh fluid, which may be reduced in strength to 10 per cent formalin. Delicate specimens such as pieces of intestine or blood vessels need to be carried through the entire Kaiserling process rapidly if a brilliant color is to be preserved. With all other specimens only the No. 1 solution need be used.

Where the specimen is a bone, the soft parts should be left attached and the specimens treated similarly to lesions of soft tissues alone.

(b) Material for microscopic examination: Tissues intended especially for microscopic examination should be cut with a sharp knife or razor into thin blocks (not over 0.5 cm. thick) and placed immediately into twenty to fifty times their volume of fixative (Zenker's fluid, formal Zenker, neutral Zenker, 10 per cent formalin, 95 per cent alcohol, or other). Their source should be accurately noted, described, and sketched. Their subsequent treatment should be that appropriate for the fixative. Special attention is called to the necessity for fixing tissues intended for cytologic study as soon as possible (under two hours) after circulation in the part has ceased. Wide-mouthed bottles or small glass jars tightly closed should be used as containers for histologic material.

8. *Shipment*.—When pathologic specimens have been fixed for two weeks or more they should be well padded with absorbent cotton wetted with the solution in which they have been last immersed, then wrapped in waterproof paper (to be obtained by requisition) and packed with paper, excelsior, hay, or similar material in a strong wooden or tin box or a barrel and shipped to the most accessible point of concentration. (See pars. 5 and 6.) Each package should be marked with the hospital number, the serial numbers of the specimens, the autopsy number, if any, and date of shipment.

At the same time there should be forwarded by mail or courier an inventory of the contents of each package, accompanied by abstracts of the clinical records of operation specimens and of clinical and autopsy records of autopsy specimens. The name of the pathologist or other medical officer who may be specially interested in the specimen should be given.

Army Regulations authorize transportation of all museum material by the Quartermaster Corps. Packages of specimens weighing 7 pounds or less should be directed on a penalty envelope marked official and delivered to an American post office of the military postal express service, with explanations of their character and the importance of their prompt delivery to prevent spoiling.

9. *Bacteria*.—Army Regulations provide that cultures of all pathogenic bacteria isolated in the American Expeditionary Forces shall be sent to the central Medical Department laboratory for confirmatory identification. The museum supply will therefore be drawn from the central Medical Department laboratory.

10. *Microscopic slides*.—Microscopic slides containing data which can not readily be duplicated in other material sent from the same source should be sent to the appropriate concentration point.

11. *Animal parasites*.—Specimens of animal parasites—if possible living—such as lice, fleas, mites, bugs, flies, mosquitoes, worms, etc., should be sent to the central Medical Department laboratory for confirmatory identification. The museum supply will be drawn from this concentration point.

12. *Missiles*.—For the psychic effect, a missile removed from the body of a wounded soldier may be given to him if he wishes to keep it. However, he may be induced to relinquish his claim when the scientific value of the comparative study of such missiles and their preservation in a museum is explained to him. The place and character of all missiles in amputation material should at least be accurately described and, if possible, sketched. All missiles and foreign bodies removed at autopsies should be carefully preserved, if possible in situ, with the pathological specimen. When it is necessary to remove them, their location and wound effects should be minutely described, the description, if possible, being accompanied by photographs or sketches.

13. *Armor*.—Armor, such as helmets, or other protective body covering showing the effects of missiles, gases, etc., should, whenever obtainable, be preserved, with full data concerning the incidents of their use, and shipped to the nearest concentration point.

14. *Instruments and apparatus*.—All instruments and apparatus of special value which have been developed or materially modified in the American Expeditionary Forces should be photographed, accurately described, and, if it seems desirable, models made and sent to the nearest concentration point.

15. *Casts and models*.—The number of skilled cast and model makers in the American Expeditionary Forces is extremely limited. When a medical officer has some specimen, or series of specimens or cases, showing results of operations which he wishes to have illustrated in wax or plaster, he should make application to the director of laboratories, A. E. F. (museum unit), A. P. O. 721, for the services of a model maker.

16. *Paintings, drawings, diagrams, etc.*—It is believed that in many hospital units there may be found men capable of making diagrams and sketches furnishing graphic records of teaching or historic value to the Medical Department. Well-trained medical illustrators, on the other hand, are scarce and their services, to be utilized in an economical manner, must be centrally controlled. Medical officers having material of scientific value, particularly in the fields noted in paragraph 2, and who are without the assistance of capable medical illustrators in their hospital units, should apply to the director of laboratories, A. E. F. (museum unit), A. P. O. 721, to have an artist assigned for temporary duty.

17. *Cinema films*.—There are few subjects (e. g., patients with "shell" shock, the technique of new operations, etc.) records of which it may be desirable to preserve in moving-picture films. Applications for the services of a cinema camerist for this work should be made to the director of laboratories, A. E. F. (museum unit), A. P. O. 721.

18. *Photographs*.—General Order No. 78, general headquarters, A. E. F., May 25, 1918, amends previous orders as follows: "The Medical Department, A. E. F., is charged with technical photography connected with the recording of photographic processes of surgical and pathological matters." For the proper discharge of this duty each hospital unit should have on its personnel, either in the laboratory or Roentgenographic department, at least one man capable of taking good technical photographs of medical subjects. A standard laboratory photographic outfit should be requisitioned by each base hospital not already

equipped. It is assumed that all developing will be done in the X-ray dark room, where will be available a ruby light, and all necessary chemicals for development and fixation of plates and prints.

In addition, the following expendable materials may be requisitioned:

Plates, Lumiere orthochromatique:

Series C, 13 by 18 cm.

Series C, 5 by 7 inches.

Series C, 4 by 5 inches.

Plates, Lumiere ordinaire, slow series C, $3\frac{1}{4}$ by 4 inches.

Plates, Lumiere, autochrome, for color photography, $3\frac{1}{4}$ by 4 inches.

Printing paper, glossy:

Soft, 5 by 7 inches.

Soft, 4 by 5 inches.

Medium, 5 by 7 inches.

Medium, 4 by 5 inches.

Hard, 5 by 7 inches.

Hard, 4 by 5 inches.

Lantern slide covers, clear glass, $3\frac{1}{4}$ by 4 inches.

Lantern slide gummed binding strips, 100 in package.

Lantern slide gummed labels, 100 in package, 1 by 10 cm.

Metol, or substitute therefor, 1 ounce bottles.

Hydroquinone, $\frac{1}{4}$ -pound bottle.

Metachinone, concentrated for Lumiere autochrome plates, 125-c. c. bottle.

Potassium bromide, xls 10 grams in bottle.

Sodium carbonate, bulk.

Sodium bichromate, 1 ounce bottles.

Sodium hyposulphite, bulk.

Sodium sulphite, bulk.

Acid, acetic, 1-pound bottles.

Acid, sulphuric, $\frac{1}{2}$ -pound in ggs. bottle.

Alumen, $\frac{1}{2}$ -pound bottle.

Alumen, chrome, 1-pound bottles.

Ammonia, 1-pound bottles.

Plate varnish, Lumiere gum damar, 50 c. c. in bottle.

Autochrome color screens, 2-inch.

Autochrome color screens, holders.

"Virida" paper for dark-room light for autochromes, 6 sheets in set.

Photographic records should be made of interesting lesions, particularly in the fields noted in paragraph 2, and of those things of medical, surgical, or pathological interest in the hospital which may be of value for teaching, research, or for their historical connection. Copies of these should be forwarded by mail or courier to the central Medical Department laboratory, (museum unit), A. P. O. 721, as soon as made, and the negatives reserved for subsequent shipment to the most accessible concentration point.

19. *Radiographs*.—Radiographs, especially those in series or illustrating wound conditions of their treatment which may be of value for teaching, should be copied in prints or lantern slides which should be forwarded by mail or courier with full data to the central Medical Department laboratory (museum unit), A. P. O. 721.

20. *Original publication*.—All pathological specimens, casts, models, paintings, drawings, photographs, radiograms, etc., should be accompanied by the name of the medical officer collecting them, and of the medical officer, if any specifically interested in their subject matter. This is important, not only for the occasional necessity for retracing them back to their origin for additional data, but also that the privilege of original publication of the data by the officer with whom they originated may be respected.

21. *Supplies*.—All requisitions for supplies will be prepared and forwarded by medical supply officer of the hospital unit. Requisitions for laboratory supplies only will be made

in quadruplicate, one copy being retained and three copies forwarded to the director of the division of laboratories and infectious diseases, office of the chief surgeon, A. P. O. 721, and it is desired that as far as possible requisitions be timed so as to permit shipment thereupon to be included in larger shipments from supply depots on ordinary requisitions. These special requisitions, therefore, should be sent approximately 10 days prior to larger requisitions contemplated, and should bear notation that shipment should be held pending the receipt of requisition of general supplies.

M. W. IRELAND,
Brigadier General, M. C., N. A., Chief Surgeon.

Circular No. 43:

AMERICAN EXPEDITIONARY FORCES,
August 1, 1918.

1. *Recommendations for promotions in the Medical Reserve Corps.*—The attention of commanding officers of hospitals and other senior medical officers is invited to the fact that the form on the back of Circular 36 should not be used for the recommendation of majors, M. R. C., because such promotions take these officers out of the Medical Reserve Corps and into the National Army. Promotions of this sort must necessarily be limited to a small class of specially capable officers, occupying positions of unusual administrative or professional importance. Such recommendations should, when made, be in the form of a special report giving with great fullness all the reasons for the promotion. They should not be made at the request of the officer interested, or except when such promotions are obviously to the interest of the service. The blank form with Circular 36 should be used, therefore, only for captains and for lieutenants about the age of 31 who are class A men.

The responsibility rests with officers making recommendations to see to it that elderly men who have no administrative capacity, and no unusual professional accomplishments which would fit them for the grade of major—in other words, men who belong to class B—are not recommended for promotion as class A men. Lieutenants within the draft age should only be recommended for promotion in unusual and exceptional circumstances, where the individual has received a military decoration, or wound, or is a man of very unusual professional ability and occupying a position of such importance as to make his promotion of obvious advantage to the service.

2. *Returning men to duty with 20th Engineers.*—Attention of all medical officers is invited to the fact that the 20th Engineers is a large regiment and the companies are designated by battalions. It is therefore necessary to always state the battalion number in connection with the company letter whenever men from this regiment are returned to duty.

3. *Messengers.*—Under authority granted by the commanding general, Services of Supply, in the future when requisitions for X-ray tubes are made on any medical supply depot, the organization making the requisition will, upon receipt of notification that the tubes are available, send the necessary number of messengers to the medical supply depot in question for the purpose of carrying back the tubes. Two tubes will be all that one man can handle.

4. *Repair of typewriters.*—The question of the repair of typewriters has been taken over by the Quartermaster Department. Hereafter all typewriters needing repair should be shipped to the typewriter repair shop, Tours, notification of the fact of shipment being made to the commanding officer thereof. Upon completion of repairs, machines will be returned to the medical units who forwarded them.

5. *Convalescent homes.*—Arrangements have been made with the American Red Cross that nurses for whom a period of change is desired for convalescence after illness may be sent to the "American Red Cross convalescent home and vacation hotel," at Le Croisie, near St. Nazaire, during the summer months instead of to Cannes as formerly.

It should be understood that in order to take advantage of this arrangement authority should be requested from the chief surgeon, A. E. F., to send the nurse or nurses to this convalescent home on a status of absent sick for convalescence with a statement as to the physical condition which requires this change. Nurses for whom this authority has been

granted should not be placed on a status of sick leave, no authority being granted for sick leave to nurses.

It is not the intention to send nurses to the convalescent homes whose physical condition is such that they are in need of nursing care. Only those who are fully able to care for themselves should be sent.

6. *Charge for subsistence of civilians sick in hospital.*—Changes, Army Regulations No. 69, provide that the charge of subsistence of civilian patients in hospital on the footing of enlisted men will be an amount equal to the commutation rate prescribed for enlisted patients plus 10 cents a day.

7. *Prompt evacuation of class D patients.*—Attention is directed to the policy of this office with respect to the disposition of all class D patients. It is not intended to hold patients for prolonged periods of observation and study who are clearly destined to fall within this class, no matter how much professional interest they excite.

Such cases should be placed before disability boards promptly for classification, and as soon as they are able to travel by ordinary train they should be sent to Base Hospital No. 8, at Savenay, with a view to their transfer to the United States. If not able to bear travel upon ordinary trains, all such patients should be sent on the hospital train which will be routed regularly to collect such cases as are able to bear the journey to the United States.

Therefore, as soon as a patient is classified as of class D he should be considered as destined for transfer to the United States, since the intention is to evacuate to the United States all mutilated and disabled men for treatment, reconstruction, reeducation, and final disposition. The necessity for this policy lies in the fact that the hospitalization program in the American Expeditionary Forces is based upon a definite priority schedule of building and of housing material, and also of tonnage space for medical supplies on ships from home ports, in direct ratio to the number of troops in France. The hospitalization program in the United States also contemplates the reception of a constant stream of evacuees from the zone of operations.

8. *Biological products.*—The following biological products have been selected by the chief veterinarian as all that are necessary for the American Expeditionary Forces. Supply depots and base laboratories will carry these only in stock:

- (a) Serum antitetanic.
- (b) Serum antistreptococcic.
- (c) Mallein intradermal.

9. *Authority to authorize expenditures and approve vouchers on Medical Department funds.*—Authority to authorize expenditures and to approve vouchers for purchases properly chargeable against Medical Department funds, in sums not to exceed \$250, is granted to the commanding officers of all hospital centers and to the chief surgeons of armies.

The authority to authorize expenditures and to approve vouchers for purchases properly chargeable against Medical Department funds, in sums not to exceed \$100, is hereby granted to chief surgeons of army corps.

10. *Hospital trains.*—When the commanding officer of a hospital is informed of the arrival of a train of patients for his hospital he will send an experienced medical officer and a sufficient number of enlisted men to unload patients from the train. This work is not to be done by the train personnel except in emergency.

Commanding officers of base hospitals are authorized to issue expendable medical and surgical supplies to the commanding officer of hospital trains, taking the memorandum receipt of the commanding officer of the train as a voucher for property return.

11. *Mail.*—It has been reported to the chief surgeon's office that some medical officers on duty in wards where there are mental cases are in doubt as to their power to prevent the mailing of letters from mental cases of an obscene or abusive nature, or letters on trivial subjects, to prominent persons. Commanding officers of hospitals should regulate this matter and see that letters of this character are not placed in the mails.

M. W. IRELAND,
Brigadier General, M. C., N. A., Chief Surgeon.

Circular No. 44.

AMERICAN EXPEDITIONARY FORCES,

August 3, 1918.

1. *System of evacuation of wounded.*—The following report of the system of evacuation of the wounded adopted by the regimental surgeon, —th Infantry, is published for the information of regimental surgeons:

1. I made a reconnaissance the night of June —th of all roads and paths between P—— road and B—— farm, including a personal reconnaissance of B——, N——, Bois la'M—— roads, etc., for suitable routes for ambulances; especial attention was given to safety of ambulances, speed and comfort of wounded, and avoidance of traffic congestion.

2. Outline the following system as the result of this study, which was very successfully followed during and after the attack:

On June —th, 1918, an advance station was organized at M——, including 3 medical officers, 8 Hospital Corps men, and 20 litter bearers. Ample supplies were stored in the dugout in which this station was located. At T—— farm another dressing station was established, with 3 medical officers, 8 Hospital Corps men, and 15 litter bearers, with reserve supply of litter bearers and corps men and medical supplies always available for forwarding to any point where added assistance might be needed. An advance station of the —d Infantry was located at B——. Their evacuation and operation of the station was under my supervision. One surgeon, one sergeant, and one private went forward from M—— with the assaulting waves, and they established a dressing station at V——. The stretcher bearers worked for this station, and the prompt need with which first aid was given at the forward station undoubtedly saved a large number of lives. At La N—— farm an advance medical supply depot was established and a reserve ambulance station. This was in the hands of 1 medical officer and 1 noncommissioned officer in charge of ambulance and medical supplies. The regimental infirmary included the regimental surgeon and 3 assistants, with 5 medical officers in reserve to be forwarded to the point of greatest need, and was located at B—— farm.

3. Thirty-five ambulances were in service for the evacuation of wounded from the battalion aid station through the regimental infirmary to Field Hospital No.—. At the time of our assault there were 2 ambulances in waiting at M—— station, 2 at B——, and 2 at T—— farm. Four ambulances were at the intermediate station at La N—— farm. As soon as a loaded ambulance going to the rear passed La N—— farm, the non-commissioned officer stationed there sent an empty ambulance forward to replace it; in this way there were always two, and no more than two, ambulances at each battalion aid station. As soon as the loaded ambulance reached B—— farm, another empty ambulance was sent forward to replace the ambulance at the intermediate station at La N—— farm. This system cut down congestion on the roads and enabled us to have ambulances always available and secured the greatest efficiency in the use of each ambulance.

4. Under the system of evacuation outlined, many wounded had reached the field hospital at B—— within one hour after the first assaulting waves had left their lines of departure. When the —d Infantry dressing station was demolished by artillery, killing one medical officer and wounding another, it was possible to replace them by two of the medical officers held in reserve for this purpose within 15 minutes after the accident and before there was any accumulation of wounded at the station.

Hospital Corps men held in reserve were forwarded to each of the battalion stations as they were needed, and when the pressure relaxed they returned to the reserve station. This arrangement allowed an elasticity which kept wounded from congregating at any station and kept a steady, constant stream of evacuations to the rear. It enabled us to evacuate the major part of approximately —— cases before midnight. At 3.30 a. m., excepting straggling cases, there were no wounded in any of the dressing stations or in the regimental infirmary, all having been sent to the rear.

The cases handled included about —— Americans, about —— each of French and Germans, each of which received hot drinks and additional medical aid at the regimental infirmary before being sent to the field hospital at B——. I left the regimental infirmary before being sent to the field hospital at B——. I left the regimental infirmary in care of a Medical Reserve Corps captain and in a motor cycle side car made the rounds of the forward stations, apportioning the reserve surgeons and litter bearers according to the need of the stations at that time, and supervised the forwarding of medical supplies as they were needed.

2. *Shortage of personnel.*—Because of the shortage of Medical Department personnel trained in the care of mental cases, it is directed that commanding officers of all base and evacuation hospitals or other Medical Department units forward to this office the names of any nurses or men who have had such training and who are not at present performing such duties.

3. *Prisoners of war.*—As soon as prisoners of war who have been under treatment in a United States Army hospital are ready to be evacuated to the C. P. W. E., the commanding officer of the hospital should notify the provost marshal general, who will send the necessary guard to escort them to the C. P. W. E. In order to economize on the number of escorts sent to the hospitals, these prisoners of war should be evacuated from the hospital in groups of five or more.

4. *Lipo vaccines.*—The following letter from the Surgeon General is quoted for your information:

I beg to inform you that the Army Medical School is now practically ready to begin furnishing triple lipo vaccine in place of triple typhoid saline vaccine. The lipo vaccine has the great advantage over the saline of being administered in a single dose. The oil permits this, since it diminishes the rapidity of absorption, and a large dose can be administered, which is absorbed gradually over a long period. It is expected in the course of a few months to stop the manufacture of the saline vaccine altogether. The quantity of machinery apparatus, necessary to this change in the method of manufacture is delaying the output for a short time only. So far this month, 30 liters have been issued, and we will soon be in position to issue not less than 150 liters per month.

After the typhoid vaccine is well on the way a similar oil vaccine will be made to be used against pneumonia, dysentery, cholera, plague, and perhaps streptococcus infections.

5. *Medical war diaries.*—Beginning with July 1, 1918, and in connection with medical histories of camps, depot brigades, and base hospitals recently filed in the Surgeon General's office, it is directed that medical war diaries be kept henceforth in these stations until the close of the war. These diaries shall be regarded as the literary property of the division of medical and surgical history of the war, Surgeon General's office, and must be entirely disassociated from the ordinary military and medical records of camps and base hospitals.

Attention is called to the fact that these records are to be regarded as stationary; i. e., the medical records of the division surgeon of a mobilized division must not be confused with the permanent medical history records of the camp or other stations in which the division has temporarily been quartered or through which it passes. The latter records must remain in the station until the end of the war as the ultimate property of the Surgeon General's office, and should not be removed by any outgoing division surgeon.

It is requested, however, that each outgoing camp or division surgeon transmit to this office (division of medical and surgical history) a carbon of his own individual contribution to the war medical diary up to the time of his departure from the station.

Medical war diaries of camps and base hospitals shall be made up of brief but circumstantial entries of any events in the history of these stations which have influenced their, sanitary status; e. g., outbreaks of epidemic diseases of major or minor importance, fires or other accidents, important changes in personnel, medical administration, sanitation, new therapeutic measures and sanitary devices introduced, new construction whether by enlargement of existing buildings or erection of new buildings, incidence of unusual diseases or complications of disease, unusual surgical cases and operations performed, or any other feature of like interest.

M. W. IRELAND,
Brigadier General, Chief Surgeon.

Circular No. 45.

AMERICAN EXPEDITIONARY FORCES,
France, August 13, 1918

I. Circular No. 6 is amended to read as follows:

1. The attention of medical officers, A. E. F., is directed to the absolute necessity for the prophylactic administration of antitetanic serum (A. T. S.) under the following conditions:

- (a) Immediately after the receipt of a wound of whatever nature or severity.
- (b) Upon the recognition of so-called trench foot, with or without skin abrasions.
- (c) In cases of frost bite.

(d) During operations performed under conditions of unsatisfactory asepsis; e. g., emergency operations, operations for hemorrhoids, fistulæ, or any conditions where fecal contamination is a possibility.

(e) During secondary operations necessary in the course of the treatment of wounds received seven or more days previously.

(f) Following the manipulations incident to the reduction of compound fractures or dislocations, after the removal of adherent drains, or any other procedure resulting in a serious disturbance of the healing processes in a wound seven or more days old.

2. One prophylactic dose of 1,000 units of tetanus antitoxin will be given to all wounded whatever the nature or severity of the wound, as promptly as possible after the infliction of the wound if a battle casualty, preferably at the battalion aid station. This dose should be given subcutaneously preferably over the lower abdomen. A second dose of 1,000 units will be given in every case after an interval of seven days.

3. In severe injuries where prolonged suppurative processes persist, especially when fecal contamination of the wound per rectum or through intestinal fistulae is present and when much tissue necrosis occurs, three or even four doses may be indicated. The attending medical officer must bear this in mind and exercise judgment accordingly in the individual case.

4. There is no objection to the use of 1,500 units for the initial and the second prophylactic doses, but doses of 1,000 units each afford sufficient protection. (NOTE.—Tetanus antitoxin from the United States usually contains 1,500 units to the dose.)

5. The serum should be administered by or under the immediate supervision of a medical officer. If for any reason this is impossible, it should be given by some responsible member of the Medical Department.

6. All injections, with amounts and dates, signed by the officer administering them, will be entered on patient's field medical card, by the letters A. T. S. followed by the date and hour. In the case of the freshly wounded the letter T should be marked plainly upon the patient's forehead with an indelible pencil.

7. Absence of any records on the patient's card or face as indicated in the preceding paragraph is to be accepted as evidence that the A. T. S. has not been given. The first medical officer to assume subsequent control of a patient thus neglected should administer the serum immediately.

8. Medical officers who are thus compelled to administer A. T. S., because of the failure of any medical officer or officers previously responsible for this administration to carry out the above instructions, must make an immediate report of such omissions to the chief surgeon, A. E. F., through the director of general surgery, with sufficient data to establish the time and circumstances of the omission.

II. *Patients dying on hospital trains.*—Commanding officers of base hospitals will receive from hospital trains the remains of any patients dying en route, and will arrange for their burial and render the necessary reports called for by existing orders.

III. *Civilian employees for hospital centers.*—Authority is hereby granted to commanding officers of hospital centers to authorize the employment of such civilian employees as may be necessary for the administration of the base hospitals under their command. The employment of these civilians must be in accordance with existing regulations; and attention is invited to Bulletin No. 14, headquarters, line of communications, February 13, 1918, and General Order No. 7, headquarters, services of supply, March 11, 1918.

IV. *Address of director of professional service.*—Attention of all medical officers is invited to the fact that the address of the director of professional service is A. P. O. 706, and that of the consultants is A. P. O. 731. Considerable mail is coming to this office for these services and addressed to post office 717. These cause a delay and unnecessary work in this office.

V. *Transportation of wounded in trucks.*—Trucks can be used to great advantage for transportation of wounded where the distances are not too great. Twelve litter cases can be carried in a 3-ton truck. In loading, 3 litters are first placed transversely in the upper tier, with handles resting on the edges of the sideboards of the truck box; then 3 longitudinally in the bed of the wagon; then 3 more transversely in the upper tier; and finally 3 more on the floor of the truck longitudinally. The tailboard of the truck remains open. The stirrups of the 3 rear litters in the lower tier fit into the opening between the body of the truck and the tailboard. In order to keep the rear patients from rolling out, one open litter is placed on edge at the back of the truck, with its lower handles resting on the side-

boards and the upper handles supported by the rear bow of the truck. It requires 12 minutes for 4 men to load 12 patients. Where there is a bank beside the road, it can be conveniently used for loading the upper tier.

VI. *Promotion and demotion of enlisted men, Medical Department.*—The commanding officers of hospital centers are authorized to promote and demote enlisted men of the Medical Department between the grades of private and sergeant, first class, inclusive. They will sign warrants "for the chief surgeon" for men promoted under this authority. The number of men promoted will not exceed the percentages authorized by law. Recommendations for promotions of soldiers of the Medical Department to the grade of master hospital sergeant and hospital sergeant will be forwarded to this office for approval.

VII. *Visits of French ladies to American wounded.*—Authority has been granted the Association of French Homes (Foyers Francais) to issue to ladies who are members of that society permits which will entitle them to visit American wounded in military hospitals of the American Expeditionary Forces. The society has been informed, however, that these visits can, as a rule, be only made during the regular visiting hours prescribed by the commanding officer of the hospital or hospital center.

VIII. *Anthrax.*—The following letter from the Surgeon General, of July 6, 1918, is quoted for your information:

1. I am directed by the Surgeon General to inform you that the number of cases of anthrax being reported to this office is sufficient to attract attention at this time. Anthrax, so far as reported, has without exception appeared on the face or neck, and shaving brushes have fallen under suspicion, and in some cases anthrax organisms have been isolated from them. For this reason, it is necessary that each case of anthrax coming to your attention be examined critically; that the man's shaving brush, talcum powder, and other shaving accessories be obtained; that the organism be sought for with great thoroughness. For the purpose of testing brushes, it is recommended that inoculations of bristles from the brush be made into rabbits, guinea pigs, and rats; nothing short of this may give conclusive results. Report should be made to this office of each case, giving the clinical history, the etiology, the results of the examination of supposedly infected material. The shaving brush or other article from which the anthrax bacillus may be isolated must also be forwarded to this office, with full information as to its source, name of the maker, and other data to facilitate its identification.

M. W. IRELAND,
Brigadier General, Chief Surgeon.

Circular No. 46.

AMERICAN EXPEDITIONARY FORCES,
France, August 16, 1918.

1. Upon the recommendation of the chief consultant in surgery, and with the approval of the director of professional services, the following instructions are published for the information and guidance of all concerned:

INSTRUCTIONS CONCERNING THE TREATMENT IN ORTHOPEDIC CONDITIONS, INCLUDING
FRACTURES AND JOINT INJURIES

2. The work of the division of orthopedic surgery in the medical organization of the Army divides itself quite clearly into two parts, one having to do with the preparation of the men for the expected combat, and the other assisting in their recovery if wounded. The first endeavors to see that they are so trained that there will be the greatest possible vigor for the combat, and that physical defects which might have rendered them ineffective are corrected. The second has to do with the treatment of the men if injured, so that there will be the least possible ultimate crippling or interference with function. The first has to do with saving men for service who would otherwise be discharged as physically unfit and also, as the result of careful training, increasing the number of days that should be expected of the men for active duty. The second has to do with the saving for service of men who but for such work might not have lived, or, had they lived, been so crippled as to be of no use to the Army.

3. Without such methods of treatment available for those needing such care in the pre-combat or training period, large numbers of men will be lost for active duty, as the ordinary medical measures can only give temporary relief.

4. Without such methods in cases of combat or other injury there will be much unnecessary loss of function and much of the acute surgical treatment will be purposeless.

5. In each of the large hospital centers, a base hospital with special personnel and equipment for caring for such cases will be installed, while in the detached base hospitals special services will be established so that there will be the least possible transferring of cases from one hospital to another.

6. Consultants in orthopedic surgery will be assigned to groups of hospitals, whose function it will be to keep in touch with the orthopedic work of the given group. These consultants should be freely used by the staff of the respective hospitals and can be reached through the commanding officers of hospital centers.

7. To best accomplish the purposes of the division and to make the services of its members available the following instructions will govern:

AMPUTATIONS

8. Cases of amputation of either extremity will be assigned as soon as possible to the orthopedic service for the needed special treatment. A guillotine amputation, for instance, without other injuries, can usually be moved without risk in one week, and with suitable measures rapid closure of the wound is usually possible so that the artificial leg can be fitted and the man get about without crutches many times in from four to five weeks from the time of injury. It is desirable that transfer to the orthopedic service take place as early as possible before contractures have taken place so that the temporary artificial limb, in case that is desirable, can be most favorably fitted and the muscles used to the best advantage.

TENDON INJURIES OR INFLAMMATIONS

9. The cases of injury to the tendons or inflammation in or about the tendons should be assigned as soon as the primary wound healing is well established, or as soon as the acute inflammatory reaction has subsided to the orthopedic service. Early transfer to these special services is important in order that the treatment having to do with the full restoration of function in the part that has been injured or inflamed may be established at the earliest possible moment and before adhesions have formed or become organized.

FLAT FEET, WEAK FEET, OR PRONATED FEET

10. Cases of flat, weak, or pronated feet associated with pain, swelling, or inflammation, when admitted to a hospital should be assigned to the orthopedic service. As soon as the acute symptoms have passed, the cases should be transferred to the nearest convalescent camp. From here, in keeping with the degree of difficulty, the cases should be transferred for full duty or to the orthopedic training camp, depot division, for training to fully overcome the weakness, or for noncombat duty under class C classification.

11. No cases of uncomplicated flat foot should be exempted from service or recommended for transfer to the United States, as all can be made useful for military service.

SPINAL STRAINS, WEAK BACKS, CHRONIC BACKACHES

12. The cases of weak, painful, or lame backs, or of sprain of the spinal or sacro-iliac joints, should be assigned to the orthopedic service. From here they should be transferred to the nearest convalescent camp as soon as the acute symptoms have passed, and from there, after a reasonable time, they should be transferred either for full duty or for noncombat duty under class C classification.

GENERAL BAD POSTURE

13. Cases of general bad posture, which is commonly associated with lack of vitality or general endurance as well as being part of the condition leading to weak feet and weak backs, should be sent for training in the orthopedic training camp, depot division.

FRACTURES

14. For all cases of fracture of bones other than of the head or face, or of extensive muscle injuries, it is of the utmost importance that proper splints be applied at the earliest possible moment so that the transfer of the patients to the hospital in which treatment is to be given, is associated with the least possible damage to the tissue adjacent to the injured bone. The Thomas leg splint, the hinged half-ring splint, the Thomas hinged arm splint (Murray modification), the Cabot posterior splint, and the ladder splinting are the appliances most needed for such work.

15. In case the fracture is compound, the wound treatment at the evacuation or other hospitals should follow the principles outlined by the chief consultant of surgical services.

16. After the primary wound treatment has been given, these cases should be transferred to the orthopedic service, in which the most approved methods for the early restoration of function to the injured part will be available. An effort should be made to transfer the cases to such services, wherever possible, within a week or 10 days of the time of injury, this being the most favorable time as regards bone repair. All fracture cases which, for any reason, can not or should not be transferred to one of the services as indicated above, should be reported to the senior consultant in orthopedic surgery, or to the orthopedic consultant of the special area.

17. Simple fractures should not be converted into open fractures except under very exceptional conditions or after consultation with one of the orthopedic consultants. A result which may not be as perfect anatomically as might have been obtained by open operation may, nevertheless, be functionally good. This is so commonly the case that the risk of infection, which is greater under the war conditions than in civil life, should be avoided whenever possible.

JOINT INJURIES

18. All injuries of the joints should be protected with the same care for transport to the hospital in which the treatment is to be given as has been indicated for fractures. Suitable splints should be applied immediately, and the standardized list of splints of the Army provides types that will meet all the needs.

19. In case the injury is associated with open wounds, the principles of the wound treatment are those which have been laid down by the chief consultant of general surgery.

20. Since in all such injuries ultimate function of the joint is the chief requisite, treatment having for its purpose the restoration of function should be instituted as soon as possible, and for this purpose it is desirable that cases of such injury be transferred, as soon as the primary wound treatment has been given, to the orthopedic service. It is important that such transfer be made before unnecessary adhesions have formed so that the restoration of function can be obtained with the least possible loss of time. In all such functional restoration it should be clearly understood that while motion is to be encouraged at the earliest possible moment, it should consist entirely of active motions performed by the patient, in which case the reflex muscular contraction will protect the joint from undue injury. All passive motion should be avoided.

21. Operations upon the joints that are not emergency in character should not be performed until after consultation with one of the consultants in orthopedic surgery.

TRANSFER TO UNITED STATES

22. It will be the policy to send to the United States, as soon as transportable, all cases that are of class D type, or cases in which prolonged treatment will be required for restoration to duty.

M. W. IRELAND,

Brigadier General, M. C., N. A., Chief Surgeon.

Circular No. 47.

AMERICAN EXPEDITIONARY FORCES,

August 28, 1918.

I. The following memorandum from general headquarters, American Expeditionary Forces, is published for the information of all medical officers concerned. Strict observance of the instructions that only class A men, fit for immediate combat duty, be sent to replacement battalions is enjoined:

I. Complaints are reaching these headquarters that hospitals are sending men to replacement battalions who are not fit for class A or immediate combat duty. The commanding general of the First Corps reports this matter to these headquarters and is advised in substance as per the telegram being sent out to-day:

"Following furnished for your information and guidance. Commanding general, First Corps, recently forwarded these headquarters complaint that men other than class A were sometimes being sent to replacement battalions, and requested authority to send all class B, C, D men to depot division for disposal. Our indorsement August 19 approved this request, with statement men sent to replacement battalion must be class A, fit for immediate assignment to combat duty, and was never contemplated that class B, C, D men be sent those battalions. Chief surgeon has been directed to circulate this information to medical officers concerned.

"MOSELEY."

II. *Discharge of civilian patients from hospitals.*—In a recent case a civilian employee of the Army was admitted to hospital as a soldier, was transferred to another hospital as such, and upon discharge from the hospital for duty was issued the uniform of an American soldier. He was later arrested on the charge of illegally wearing the uniform. Commanding officers of hospitals should take every possible precaution in issuing uniforms to patients being discharged from hospital that they are only given to those entitled to wear them.

III. *Appliances.*—Requisitions for all appliances which require heat or power should show in the column "Remarks" whether gas or electricity is available; and, if the latter, the type of current, voltage, and cycle will be designated. This applies in particular to X-ray, dental, and laboratory equipment.

IV. *Prolonged active hospital treatment.*—Patients have recently been evacuated from the front to Services of Supply hospitals "For continuation of antisyphilitic treatment." General orders and circulars issued on this subject provide that "Only cases presenting complications indicating the necessity of prolonged active hospital treatment will be transferred back from the regimental lines." In this connection, attention of all medical officers is called to paragraph 5, section 1, General Order 34, general headquarters, 1917, and paragraph 5, Circular 15, office of chief surgeon, 1917.

V. *To registrars of all hospitals.*—The copies of Form 22, A. G. O., received in this office are in many cases so illegible as to be unavailable for use. Unless better copies are sent, it will be necessary in a large proportion of the reports to require that new sets be made out and forwarded. To obviate this necessity it is suggested that first and third, or second and third, copies of the original impressions be forwarded to this office.

VI. *Evacuating officers and soldiers from hospitals.*—There have been frequent complaints that orders governing the evacuation of officers and soldiers from hospitals were not being complied with. Commanding officers of hospital centers and hospitals are charged with the duty of seeing that all the officers of their command concerned with the evacuation of patients from hospitals are thoroughly familiar with the orders governing this subject. In this connection attention is called to section 7, General Orders 111, general headquarters 1918; section 2, General Orders 11, Services of Supply, 1918; section 1, General Orders 41, general headquarters, 1918; and Circular Letter 6-A, office of chief surgeon, 1918.

VII. *Records to accompany patients on evacuation from hospitals.*—1. Attention of all medical officers is called to the instructions on the field cards, which state that these cards are to be securely fastened to the patient's clothing. These instructions are not being carried out, and as a result patients and their cards are becoming separated and there is a great confusion of records. In some cases when patients are being evacuated by hospital trains the field cards are turned over in bulk to the train commanders. This method of transfer of field cards is not authorized, and train commanders are hereby instructed not to accept field cards in this manner.

2. Many patients are being received at hospitals in base ports for evacuation to the United States without adequate records of previous condition. Attention is called to the requirements of General Orders 41, general headquarters, 1918; section 1, paragraph 8; and to the Manual of Sick and Wounded Reports, sections 6 and 7, and section 9, paragraph 12.

3. In making report, disability boards will use card Form No. 25, statistical section, A. G. O.

VIII. *Personal property of patients.*—It has been reported that articles of value have been turned in, without receipt, by great numbers of wounded soldiers at field, evacuation,

and other hospitals and that on their being evacuated to other hospitals these articles have not been returned to them. Commanding officers of hospitals should give this matter their attention and endeavor to see that personal property belonging to their patients accompanies them upon evacuation.

IX. *Fire protection*.—The following suggestion is made to this office by the bureau of fire protection:

In hospitals where different types of construction have been used, commanding officers should keep in mind in making assignments of patients to wards that on account of difficulties of evacuation in case of fire the more serious bed patients should, whenever practicable, be placed in less inflammable wards.

X. *Ordnance equipment*.—Commanding officers of hospitals in and adjacent to Paris are informed that all ordnance equipment, with the exception of guns and ammunition, should be shipped to the American salvage depot, St. Pierre des Corps. All firearms and ammunition should be shipped to the advance ordnance depot No. 1, at Is-sur-Tille. Guns should be securely packed in boxes or tied together and well wrapped so that they may arrive in as good condition as possible. All salvaged clothing which is not required can be turned in to the American salvage depot, 110 Boulevard de Hospital, Paris.

XI. *Requisitions for X-ray supplies*.—A Roentgenologist has been attached to intermediate medical supply depot No. 3 for the purpose of acting upon requisitions for X-ray supplies. Hereafter requisitions for X-ray supplies will be listed separately as heretofore but will be sent direct to the intermediate medical supply depot No. 3, A. P. O. No. 737.

XII. *Emergency medical teams*.—The medical teams heretofore known as "gas teams," or "shock teams," will be known in the future as "emergency medical teams." They are to be used in emergencies for the medical care of the wounded (especially chest wounds) and for those suffering from surgical shock as well as gas.

XIII. *Front-line packages*.—It is directed that commanding officers of Services of Supply hospitals stop the practice of making requisitions for the "front-line packages" prepared by the Red Cross. There dressings are expensive and not specially suited to regular hospital work. They are intended for use at the front only.

XIV. *Rest rooms for nurses*.—The building of Red Cross amusement rooms and rest rooms for nurses has unfortunately been much delayed at many base hospitals on account of the demand for more beds for patients and the necessity for using all available material and labor to provide the additional room needed for the sick and wounded.

M. W. IRELAND,

Major General, M. C., Chief Surgeon.

Circular No. 48:

AMERICAN EXPEDITIONARY FORCES,

September 9, 1918.

I. *Official relations between medical and veterinary personnel*.—(1) The veterinary service of the American Expeditionary Forces is by special order now placed under the authority of the chief surgeon, and the Veterinary Corps will in the future function under Special Regulation 70, dated Washington, December 15, 1917.

This special regulation is not to be interpreted as placing individual veterinary officers or veterinary organizations under the authority of medical officers. On the other hand, it is to be interpreted as placing all detachments of veterinary personnel in an independent status with reference to other Medical Department personnel.

The senior veterinary officer of any organization or station, therefore, would bear the same relationship to the commanding officer thereof as does the senior medical officer, and, as a detachment commander, he has the same responsibility for the care, instruction, and discipline of his men.

(2) Senior veterinary officers are not to be considered as assistants or subordinates to corresponding medical officers. It is not contemplated that correspondence, reports, or returns emanating from or pertaining to the Veterinary Corps will pass through the office of medical officers as part of the routine channel of communication.

(3) Requisitions for veterinary supplies will be forwarded as follows: (a) Organizations with divisions through division veterinarian, and upon his approval, in the manner as laid down by General Order 44. (b) Officers commanding veterinary hospitals and other independent units direct to proper supply depot.

(4) Although the independence of action outlined herein is expected to govern official relations between the medical and veterinary services, it should not be forgotten that the activities of both are in contact at several points and that frequently occasion arises when the medical officer, by reason of longer service and broader experience, can be of material assistance to the veterinary officer. This is particularly true as regards army, corps, and division surgeons and veterinarians.

Senior medical officers will therefore cooperate with veterinarians and assist them by counsel and advice in the handling of duties newer to many of them. While the veterinarian should welcome such assistance, he should at the same time cultivate independence and authority in his department and avoid submitting himself to such supervisory action as would tend to destroy his initiative and sense of responsibility.

II. *Telegraphic reports.*—Commanding officers of hospitals in making telegraphic reports to the British authorities of deaths of British officers and soldiers should indicate in the report the number or name of the hospital from which the report is being made.

III. *Inspection.*—It has been brought to the attention of this office that isolated detachments connected with divisions, and with the Services of Supply, sometimes fail to undergo the regular inspections for venereal disease. The attention of all responsible medical officers is called to this oversight.

IV. *Treatment of Y. M. C. A. personnel.*—The requirements of Circular 37, paragraph 8 calling for reports to be submitted to Y. M. C. A. headquarters for Y. M. C. A. personnel treated in American Expeditionary Forces medical formations are not being observed. In many cases diagnoses are not given or anything indicating the condition of the patient on discharge from hospital. These reports should be addressed to medical section, Y. M. C. A. headquarters, No. 12 Rue D'Aguesseau, Paris, which change of address will be noted.

V. *Rating of enlisted men.*—Commanding officers of hospital centers are authorized to rate enlisted men under paragraph 1420½, Army Regulations. Report of any ratings made under this authority will be forwarded to this office.

VI. *Carrel-Dakin tubing.*—There is great difficulty in meeting the needs for Carrel-Dakin tubing. Every effort must, therefore, be made to conserve the supply. The commanding officers of hospitals will give such instructions as to insure that the tubing after use will be cleansed and sterilized and again used, and that all received at the hospital in excess of the needs of the hospital will, after cleaning and sterilization, be returned to the nearest supply depot.

VII. *Nurses.*—Any member of the Army Nurse Corps who marries while on active service in France will be returned immediately to the United States for duty and will not be discharged in France. Report of the marriage of any nurse will be immediately reported to this office by the proper commanding officer.

VIII. *Ordnance equipment.*—Decision has been rendered that mess equipment and canteens should be issued to patients upon discharge from hospitals, whether patients are to go to replacement organizations or to convalescent camps. The commanding officers of hospitals are instructed to maintain a sufficient supply of this ordnance equipment to issue to patients upon discharge.

IX. *Reports of issues of ordnance to patients discharged from hospital.*—Circular letter No. 6-A, from this office, requiring that ordnance property issued to patients leaving hospitals be dropped on a monthly abstract of issues showing the quantity of each kind of article issued during the month and giving the names of the soldiers to whom such uniform equipment has been issued, is with the consent of the chief ordnance officer amended so that the names of the soldiers to whom these articles are issued will not be required.

X. *Conservation of supplies.*—The necessity for the utmost economy in all surgical dressings and supplies is obvious. Not only the limitations imposed by the tonnage situation, but the enormous increase in the burden thrown upon the manufacturer, makes this essential. Gauze and bandages should be repeatedly washed and sterilized. Rubber gloves should be

cleaned and tested. Wastage in catgut should be avoided by insistence upon an economical method of tying. Ether should be conserved. Only by the cooperation by the entire surgical staff of each hospital can the desired conservation of supplies be brought about, and the importance of this subject should be repeatedly impressed upon all concerned. The Surgeon General reports some most satisfactory results in the United States through efforts at conservation and suggests the following method:

While the varying equipments of different hospitals may modify the method used for the reclamation of gauze and bandages, the following method is suggested: Each surgical ward and dressing room should be equipped with two galvanized-iron buckets with a cover, lined by a paper bag in one of which should be put all blood-stained and slightly soiled dressings; in the other, pus-stained dressings. These buckets should be taken twice daily—oftener, if necessary—to the room where dressings are washed. If no laundry equipment, or laundry machinery, is available, the gauze and bandages can be washed by hand, using heavy rubber gloves for this purpose. Previous to washing, the slightly stained and blood-stained dressings should be soaked for 12 hours in cold water containing one-tenth per cent of chloride of lime; the pus-stained dressings in a solution containing one-tenth of 1 per cent chloride of lime and one-half of 1 per cent washing soda. If washed by hand, these dressings should be boiled for at least one hour. When laundry machinery is available, or in the larger hospitals which are now being furnished with equipment for the reclamation of re-use knitted gauze, ordinary gauze and bandages may also be reclaimed. The gauze and bandages should be put in mesh bags, soaked for 12 hours as directed above, boiled for 1 hour, transferred to the washing machine, and, if a rotary tumbler is available, can be dried in the bags in this tumbler. If this is not available, gauze and bandages can be passed through a wringer and hung on lines to dry. After drying dressings should be sorted, folded, put in packages, and sterilized in the ordinary way for 30 minutes at 15 to 30 pounds pressure, on two successive days. Careful bacteriological tests should be made from time to time to test its sterility.

M. W. IRELAND,

Major General, M. C., Chief Surgeon.

Circular No. 49.

AMERICAN EXPEDITIONARY FORCES,

September 18, 1918.

I. Preparation of gum-salt solution.—Prepared solution of gum-salt for intravenous infusion in cases of hemorrhage and shock will be limited to field, mobile, evacuation, and advanced base hospitals really functioning as evacuation hospitals, where, during active periods blood transfusion may be impossible of accomplishment. Such hospitals may obtain gum-salt solution from the nearest Army medical dump or from the central Medical Department laboratory. The solution is issued in 500 c. c. automatic stoppered bottles, 12 bottles to a case. Both cases and bottles are obtained with great difficulty, and empty bottles and cases must be returned in order to receive replenishments.

In base hospitals, generally, blood transfusion should be the procedure of election and intravenous infusion of gum-salt solution resorted to only in emergency. The small stock of gum-salt solution necessary to meet those emergencies should be prepared locally, by each base hospital for its own use. Directions for the preparation of the solution may be obtained from the director of laboratories, A. P. O. 721.

In order that all the acacia that is available may be conserved for use in the preparation of gum-salt solution, its issue from supply depots for dispensary use is interdicted.

Requisitions for acacia in small quantities, not to exceed 5 pounds in the instance of base hospitals, will be honored, provided the notation: "For preparation of gum-salt solution" is entered opposite this item in the column of remarks.

II. Transfusion sets.—On several occasions requisitions for transfusion sets have been received from base hospitals with the explanation that the transfusion set formerly on hand had been taken to an advanced field, evacuation, or mobile hospital by some member of the staff on detached service with a "shock team."

The impression has been gathered, apparently, that transfusion sets issued to individuals, upon completing the course in resuscitation at the central Medical Department laboratory, were for their personal use. This impression is erroneous, as each set was destined for use in the hospital to which the individual returned, and should have been turned over to the supply officer of the hospital.

All transfusion sets now in the possession of individuals will be turned in to the supply officer of the hospital to which they are permanently attached. Transfusion sets have been issued to advanced hospitals, and reserve supplies have been placed in Army medical dumps. These supplies are adequate for the use of "shock teams" serving temporarily at advanced hospitals.

III. *"Shock teams."*—It is directed that emergency medical teams ("shock teams"), when once formed, be left intact by commanding officers of Medical Department units unless specific authority to change personnel of these teams is obtained from the office of the chief surgeon or from the director of professional services.

IV. *Purchase of foodstuffs.*—The following letter from general headquarters is quoted for the information of all concerned:

We are in receipt of information from the French mission, general headquarters, A. E. F., stating that in certain localities American troops are offering prices for foodstuffs in excess of the prices fixed by the French authorities. This practice is obviously bad in whatever way considered.

Please take necessary steps to have the troops under your command pay no more for their open-market purchases of foodstuffs than the price fixed and published by the French authorities.

V. *Coast Artillery casualties.*—All Coast Artillery casualties discharged from hospitals as of class A shall be sent to Angers.

VI. *Epidemic disease.*—The attention of surgeons of all organizations and commanding officers of all Medical Department units is again called to the necessity for prompt report to the local French civil and military authorities of all cases of epidemic disease. This report should give the name and organization of patient.

VII. *Clinical records.*—It is desired that the clinical records of patients treated in Services of Supply hospitals be as complete as circumstances will permit. Form 55, Medical Department, will be used for this purpose. Form 55-A will be made out for all patients, but only such other parts of Form 55 will be used as are of interest or value in the individual case. The clinical record for completed cases will be filed in the hospital in which the case is completed. When patients are transferred from one Services of Supply hospital to another, Form 55 will be placed in the envelope with the field medical card.

VIII. *Construction at base hospitals and hospital centers.*—Many cases have occurred recently where patients were evacuated from one hospital to another without sufficient rations. In travel of this sort there are many and unexpected delays. In addition to the cooked rations issued for the expected length of the journey, a reserve of cooked or travel rations for at least 36 hours over and above ordinary schedule time should be issued for each patient. The number of such travel rations issued can be noted on the travel order and patients required to turn in rations unused on arrival.

IX. *Reports.*—Circular No. 28, section on allied patients in American Expeditionary Forces' hospitals, is modified to read as follows:

"PAR. 2. When French military patients are admitted to, discharged from, or die in, American military hospitals in the French zone of the armies, notification of the fact will be sent within 24 hours, on Form 52, Medical Department, to American statistical section, 10 Rue St. Anne, Paris."

"PAR. 7. A separate daily list of casualties and changes of patients in hospitals, Form 22, A. G. O., S. D., A. E. F., will be made out for all British patients; two copies will be forwarded to the deputy adjutant general's office, Third Echelon, British Expeditionary Force, France, and another to medical communications, British Expeditionary Force, France. No copy will be sent to the chief surgeon, A. E. F., the monthly report called for in 1-b being sufficient."

X. *Patients to be examined by board of officers.*—It is desired that in the future no patients be transferred from hospital, either to duty or convalescent camp, without having been examined by a board of medical officers. In most cases disability boards already appointed can act upon all such cases. Where the time of disability boards is fully occupied with class D cases, a board, to consist of the chief of service and ward surgeon, can act upon cases going to duty or convalescent camp. Complete physical examination will not usually be required in such cases, and no formal record of the proceedings of the board other than a note by the senior member on the patient's clinical record.

XI. *Hospital fund.*—In view of the fact that irregularities in the hospital fund of a base hospital have been discovered, the following recommendations have been made by the officers conducting the investigation will be carried out in all base hospitals:

The commanding officer of each base hospital in the American Expeditionary Forces will appoint an auditing committee for the hospital fund, with instructions to make a careful examination of the hospital fund accounts from the time of the establishment of the hospital in France, with a view to determine if funds due from all sources have been collected and accounted for, and also to take necessary steps to see that the fund is carefully and methodically audited each month hereafter.

A cash book will be kept by the custodian of the hospital fund in every hospital in such manner as to show the daily receipts and expenditures from the hospital fund.

Patients who are charged board in hospitals should, if they are not able to pay their mess bills, sign an acknowledgment showing their indebtedness. The accounts of pay patients should be checked against the daily lists of patients received and discharged so as to show that the full amounts due are paid.

Arrangements will be made to secure the services of skilled accountants who will from time to time be sent to base hospitals to investigate their hospital fund accounts.

M. W. IRELAND,

Major General, M. C., Chief Surgeon.

Circular No. 50:

AMERICAN EXPEDITIONARY FORCES,

October 4, 1918.

I. (1) *Instructions regarding hospitalization and evacuation of patients with disease or injury of the eye, ear, nose, throat, and maxillo-facial region.*—In general, the policy as regards hospitalization and evacuation of these cases is as follows:

(a) Simple cases should, whenever possible, be retained for treatment with their organization or be treated in near-by camp, field, or evacuation hospital.

(b) Cases not suitable to be retained with organizations but which will be fit for return to duty in the American Expeditionary Forces within a reasonable time should be transferred to the nearest camp or base hospital.

(c) Cases which are permanently unfit for duty in the American Expeditionary Forces, or which will require prolonged treatment to render them fit for duty, should be classified as "D" and evacuated as soon as safely transportable to the United States. Class D cases, in which healing might be materially retarded by delay or interruption of treatment incident to evacuation to the United States, or which have unsightly wounds of the face or neck that could be materially helped within a reasonable time, should be retained for primary treatment in the American Expeditionary Forces.

The treatment of cases retained in France must involve the least possible amount of transportation from one hospital to another, and facilities will be provided in each hospital center and in the larger base hospitals not connected with hospital centers for the treatment of this class of cases. Base Hospital No. 115, located at Vichy, has more elaborate equipment for this class of cases.

Consultants in the different specialities will be located at certain hospitals, whose services can be called upon by neighboring hospitals. Addresses where these consultants can be reached will be published from time to time.

(2) *Ophthalmic cases.*—Routine refractions and vision examinations for troops should be done in the nearest hospital serving these troops. Ophthalmic cases which require more elaborate treatment than can be given in isolated camp or base hospitals and which do not come within the provisions of paragraph 1 (c) above, should be transferred to the nearest hospital center, or upon recommendation of the local or senior consultant in ophthalmology be transferred to Base Hospital No. 115, Vichy.

(3) *Ear, nose, and throat cases.*—Cases of disease or injury of the ear, nose, or throat which require more elaborate treatment than can be given in isolated camp or base hospitals and which do not come within the provisions of paragraph 1 (c) above, should be trans-

ferred to the nearest hospital center, or, upon recommendation of the local or senior consultant in oto-laryngology, be transferred to Base Hospital No. 116, Vichy.

(4) *Maxillo-facial cases.*—Cases evacuated to the Paris district will be treated at the American Red Cross Military Hospital No. 1. Other cases that can not be treated in the hospital in which they are situated may, on request of the local or senior consultant in maxillo-facial surgery, be evacuated to a base hospital or hospital center where there is a maxillo-facial service, or to Base Hospital No. 115, Vichy.

Maxillo-facial cases requiring only occasional surgical or dental supervision may be sent from the base hospitals to convalescent camps to await further examination or operation.

No maxillo-facial case should be evacuated to the United States until the patient can open his mouth sufficiently and has the pharyngeal muscle control necessary to obviate the danger of aspiration during seasickness.

Cases that have been recently repaired should be retained in hospital until the sutured wound is safely healed.

II. *British soldiers in American hospitals.*—Pursuant to recommendation from the British authorities, the following instructions will govern visits of relatives to dangerously ill British soldiers in American hospitals:

(a) In all cases requests for relatives to visit British soldiers dangerously ill in American hospitals should be sent to the A. D. M. S., Paris, and not direct to the relative of the patient.

(b) When the American hospital is located outside of Paris or its near vicinity request should be made to the A. D. M. S., Paris, and at the same time there should be a statement as to whether suitable accommodations for the relatives of the soldier exist at the place where the American hospital is situated. In those cases where it is not possible to accommodate relatives it is not proposed to make arrangements for the relative to visit.

III. *Evacuation of orthopedic cases.*—Some confusion has resulted from apparent conflict of instructions in Circular Letter A-1 and Circular 46, Office of Chief Surgeon. All instructions regarding evacuation of this class of cases, issued prior to Circular 46, are revoked.

IV. *Pail collection system.*—Reports have been received at this office that in certain of the hospitals where the pail collection system is used, urine and other human excreta has been dumped into the sewer system. Attention of all responsible officers is called to the fact that where the pail system is used the sewer system is provided for sink waste only and that there is no purification system adequate to care for human excreta. Steps should be taken at once to prevent a recurrence of this faulty method of using the sewer system.

V. *Ordnance property.*—The following information, received from the chief ordnance officer, is repeated for all concerned:

It has come to the attention of this office that the "pouch for small articles, model 1916," which is furnished the Medical Department by the Ordnance Department, has been incorrectly called "pouch for adhesive tape and foot powder." The supply division of the Ordnance Department has been notified to discontinue the use of this name, "pouch for adhesive tape and foot powder."

VI. *Reports.*—The following revisions in the Manual of Sick and Wounded Reports for the American Expeditionary Forces, revision of September 15, will be noted, effective October 1:

Section IX, paragraph 11 (p. 9), sentence "Cases transferred to convalescent camps will be considered completed as far as the records are concerned," is revoked.

Section XXI, paragraph 2 (p. 51), is revoked.

In the future all convalescent camps will report as do base hospitals carrying patients on sick report. Hospitals will not consider that cases are completed when the patients are transferred to convalescent camps.

VII. *Promotions.*—Since the issue of Circular 36, of this office, explaining the general principles of the system of promotion by roster in the Medical Department, two very important orders have appeared which, while not upsetting this scheme, have modified it to a certain extent. The first of these was Bulletin 59, general headquarters, dated August 16, which abolished distinctions between the Regular Army, National Army, National Guard, and Reserve Corps, merging all of these in the United States Army. It also announces that the principle of selection will govern for promotions.

General Order 162, general headquarters, dated September 24, gives the rules under which promotions are made and states that they will be temporary appointments made by the commander in chief, pending approval by the War Department.

The general effect of these orders is to give greater importance to the factor of special qualifications in determining the roster number. The value of this factor is determined by the chief surgeon and is based upon the reports received of the officer in the "Report of character of services and qualifications" on the form published in connection with Circular 36 (known as C. S. and Q. report). General Order 24 has been revoked, and at least half of the data required thereby have been eliminated. If the Form C. S. and Q. is accurately made out, it furnishes all the data necessary. Attention is, however, invited to the importance of its being signed, with date and station, by the officer making the report. Attention is also called to the fact that a statement of the physical condition is required which, however, need not be the elaborate report upon the prescribed form heretofore required. The requirement is simply:

(d) A certificate that the officer has been examined by a medical officer and found physically fit to perform the duties of the grade to which he is recommended for promotion will be forwarded with the recommendation.

If an officer is temporarily disabled by wounds or sickness, a careful statement of the nature of the disability and the length of time which it will probably prevent him from performing his duty should be given, with a statement that the officer is with the exception of the disability noted physically fit to perform the duties of the grade to which he is recommended.

M. W. IRELAND,
Major General, M. C., Chief Surgeon.

Circular No. 51:

AMERICAN EXPEDITIONARY FORCES,
October 12, 1918.

PNEUMONIA, ITS PREVENTION AND MANAGEMENT

THE PREVENTION OF PNEUMONIA

The present epidemic of respiratory infection in the American Expeditionary Forces is largely influenzal in character, with a rather high incidence of secondary pneumonia due usually to pneumococci or streptococci and occasionally to influenza bacilli and possibly to meningococci. The mortality has been in the neighborhood of 30 per cent. As primary pneumonia is likely to increase with the advent of colder weather, medical officers are reminded that the prevalence of pneumonia, as well as of other respiratory infections, in armies in the field depends particularly upon:

- (1) Overcrowding.
- (2) Exposure to wet and cold.
- (3) Fatigue, whether induced by overwork, a long journey, loss of sleep, or nervous exhaustion from worry.

Crowding forces the occupants in barracks or billets into close personal contact, and the greatest danger from it in relation to the occurrence and spread of respiratory infections is obviously in the increased opportunity furnished for droplet infection of the healthy inmates from those who already harbor pathogenic micro-organisms in their noses or throats.

In epidemics of pneumonia or of influenza, the disease is undoubtedly usually spread from man to man through the secretions or discharges from the mouth, nose, or other parts of the respiratory tract, and an individual who harbors virulent pneumococci or streptococci or influenza bacilli is obviously very likely to infect his cosleepers by coughing or sneezing, or even speaking loudly in close proximity to them.

In the present epidemic, the great majority of the cases of pneumonia are secondary to influenza—the natural resistance of the individual having been first broken down by this disease, secondary infection of the respiratory tract with pneumococci or streptococci has occurred.

In Panama, where climatic conditions were not severe, pneumonia was prevalent, particularly on account of overcrowding, and the same was found to be true among the workers in the South African mines. Prevention consisted particularly in scattering the individuals and giving them separate dwellings in place of barracks.

Overcrowding.—In relation to overcrowding, Medical War Manual No. 1, for 1917, authorized by the Secretary of War under the supervision of the Surgeon General and Council of National Defense, states that whenever possible the floor space per enlisted man should be 80 square feet, affording 960 cubic feet, and should never be less than 10 by 6 feet, or 60 square feet, which with a ceiling 12 feet high would afford 720 cubic feet. This manual further states that should an epidemic occur and should the soldiers be overcrowded, it may be assumed axiomatically that the epidemic can not be checked by other sanitary measures alone, but must be combined with measures to relieve the overcrowding. Owing to the shortage of lumber and materials, it was thought necessary in the American Expeditionary Forces to reduce the space per man to 1 linear foot, or 20 square feet—one-third of the minimum amount recommended. The order directs that bunks shall be 2 feet 8 inches wide by 6 feet 6 inches, double tier, in sets of four, 2 feet 8 inches apart, giving 1 linear foot of Adrian barracks per man. It is hoped that conditions will soon be such that this allowance may be increased. In the meantime, an effort must be made to prevent droplet infection by other means between the men sleeping side by side in barracks. A board partition 2 feet high may be built between the two adjoining bunks. Until this is done, wires may be run 2 feet above the bunks and the shelter tents suspended upon them between the adjoining bunks. Similar precautions should be taken in billets and tents. This is a more practical arrangement than placing the head to the feet of the adjacent sleeper. In cases where the overcrowding is excessive and the weather fine, the advisability of bivouacing the men in the open air under shelter tents, or other canvas, should be considered. If this is done, additional blankets obviously should be supplied. Relief from the dangers of overcrowding should be the first important consideration in connection with the checking of the present epidemic. Distance between beds is the important factor, not cubic space, in the prevention of the spreading of pneumonia infections. Crowding in recreation rooms at cinematograph entertainments, etc., should at present time be prevented as much as possible.

Wet and cold.—Wet and cold are also important predisposing factors in pneumonia epidemics. A lowered condition of vitality from cold favors particularly the development of such infectious diseases as pneumonia and influenza, by lowering the resistance of the bronchial and pulmonary tissues to infection. Experiments suggest that infections with these diseases are favored by cold and chilling through the stimulation of the mucous glands with resulting closure of the small bronchioles with plugs of mucus. It is well known that the functions of the leucocytes are disturbed by cold, and it seems likely that phagocytosis may play an important rôle in connection with the mechanism of immunity in pneumonia, and that immunity is in this disease particularly related to the functions of the leucocytes. The movements and phagocytic action of the leucocytes occur most favorably at about the temperature of the normal body. Exposure of the skin to cold and wet leads to chilling of the leucocytes during their repeated passage through the skin capillaries, which may diminish their functional activity, and thus lower resistance to a point at which infection may occur. It should be borne in mind that cold wet feet produce a general reaction of the body and not only a local one, and that this condition also predisposes to infection. Cold and wet have less unfavorable action when accompanied by energetic muscular exercises, if a condition of fatigue is not reached. Additional efforts should be made to provide for the prompt removal and drying of the wet clothing of the soldier, and additional blankets at night must be insisted upon.

Fatigue.—It should be borne in mind that fatigue induced by overwork and also by lack of sleep and worry in connection with wet and cold has been one reason for the excessive mortality from pneumonia in armies in the field. It is well known that normal resistance to infection may be broken down by fatigue.

Early detection.—Greater attention should be paid by medical officers to the early discovery of cases of colds, cases of influenza, and other respiratory infections, and to prompt isolation and treatment of such cases. Carriers undoubtedly play an important rôle in disseminating pneumococci, streptococci, and influenza bacilli as well as meningococci.

Warning against spitting.—Men should be specifically instructed at this time against expectorating in quarters, and the danger of sneezing and coughing and of speaking in close proximity to the face explained.

THE MANAGEMENT OF PNEUMONIA

1. Pneumonia, especially as it occurs among troops, and as it is now present in the American Expeditionary Forces, must be regarded as a highly contagious disease, and it must be managed with the same precautions as are taken in the care of other contagious diseases.

2. The epidemics of influenza now prevalent in many widely separated parts of France have at least one point in common; i. e., the occurrence of pneumonia as an incidence of the disease, a complication, or a sequel. The pneumonia is usually of a patchy type, different slightly in its characteristics in different regions, but characterized by rapid progress, great respiratory distress, frequency of early collapse, and high mortality. The causative organism may not always be the same; pneumococcus, streptococcus, and the influenza bacilli and occasionally the meningococcus all seem to contribute their share.

3. Early isolation and hospitalization of pneumonia as well as of influenza and similar respiratory infections will do much to prevent the spread of the disease and lower the mortality. Cases should be hospitalized, when possible in medical formations where they may remain until recovery, even though the initial trip by ambulance may be somewhat lengthened. Cases of pneumonia in the earliest stages withstand transportation fairly well, but later in the disease after they are hospitalized, they are greatly injured by moving. Numerous cases of respiratory infections have been evacuated by train or by motor, to arrive at their destination some hours later in profound collapse, to die within a very short time. Moving a case of pneumonia to make room for a battle casualty may kill the pneumonia patient and not aid the wounded, and the practice should not be tolerated.

4. Isolation or segregation should be practiced in all cases of respiratory infection and such isolation should start in the field. Upon arrival at the hospital the cases of respiratory infection should be received in wards devoted to the observation of cases with respiratory infection; or if it is possible to make an absolute diagnosis on admission to the hospital, the case may be sent directly to the ward designated to receive cases suffering from that particular type of infection. The observation ward for respiratory diseases should be cubicled, a sheet or other partition being placed between adjacent beds. It is desirable that an accurate diagnosis be made as soon as possible of cases in this ward so that they may be transferred immediately to those wards designated to receive cases suffering from the different types of respiratory infection. All cases of uncomplicated influenza should be isolated in separate wards as rigidly as if they were cases of measles, and all beds should be cubicled. No cases of pneumonia should be sent to these wards, and should a patient with influenza develop pneumonia he should be immediately removed to a pneumonia ward. Cases of pneumonia should be segregated in wards set aside for this purpose. These wards should be cubicled. The reason why such rigid isolation and employment of the cubicled system is imperative is due to the fact that, first, cases of influenza are highly susceptible to pneumonia and may be infected with great readiness by a pneumonia patient in the near proximity, and, secondly, that the lobular type of pneumonia may be caused by several varieties of organisms, and should a patient with a pneumococcal pneumonia be placed next to one with a streptococcus pneumonia either one or both patients might readily contract a double infection. The course of the disease in such double infections is much more serious and the mortality much higher than in single infections. Cross infections will, therefore, be less common and the mortality reduced by cubicle isolation for all respiratory infections. The practice of receiving respiratory infections of unknown origin in wards with other medical or surgical cases is reprehensible and is responsible for many fatal cases of pneumonia in individuals who might otherwise have been returned to duty within a short time. Cubicle isolation may most readily be carried out by screening with sheets. This can be done by posts and the use of wire and can be adapted for tents as well as for wards. It is only necessary that the screen should reach midway between the foot and head of the bed, halfway between the bed and the floor, and $2\frac{1}{2}$ to 3 feet above the level of the patient. It is, however, highly important that the screen should extend several inches beyond the head of the bed.

5. Protection of medical officers, nurses, and personnel with gowns and fresh and clean gauze masks is important, both to prevent spread of infection among them and to prevent their transmitting infection to others. Attendants should be examined with the view to finding carriers: When found, these should be disinfected. Masking of all individuals who come in contact with cases of respiratory infection and fever, except in case of extreme urgency, and then only with precautions to prevent the transmission of the disease to others. Patients should be masked while being moved.

6. Special attention must be paid to all cases of respiratory infection, with fever with relation to the development of signs of pneumonia. It is often impossible at the outset to distinguish between cases of influenza, without consolidation, and actual pneumonia. All cases, with fever and with symptoms referable to the respiratory tract, must be viewed with suspicion and hospitalized, and the physical signs must be carefully watched.

7. Bacteriological examination in order to determine the infecting organism is important, not only from the standpoint of specific therapy, but also to facilitate the management of cases of different etiology. It must be remembered that pneumonia is really a group of diseases, with certain common signs and symptoms. The promiscuous mingling of cases of pneumonia, without determination of the infecting organism, is as harmful as the mingling of measles, scarlet fever, and smallpox.

8. Specific therapy, when possible, is advisable. This will at present be limited to cases of pneumonia due to pneumococcus, type 1. The indiscriminate use of serum, without proper type determination, is ill-advised, not only on account of the fact that it subjects the patient to unnecessary inconvenience, discomfort, and possibly danger, but on account of the fact that serum is scarce, and must be saved for the cases in which it is actually indicated. The polyvalent serum may be used in type 1 cases, as its titer for the type 1 organism is as high as that of the monovalent type 1 serum. The use of polyvalent serum in cases other than those due to pneumococcus, type 1, is not advised.

9. General treatment should be directed toward sustaining the patient and guarding against collapse. Under no circumstances should a patient with pneumonia, or suspected of having pneumonia, be allowed to walk, and after he is put to bed he should not be permitted to sit up for any reason whatsoever. He must be kept warm, but must be assured a continuous supply of fresh air. Fluids should be given freely from the start, and the patient should be induced to take them frequently and in considerable amounts. Sponge baths should be used to combat high temperatures.

10. Early cyanosis and collapse are characteristic of the present form of pneumonia. Treatment aimed to prevent and to combat circulatory failure should be instituted promptly on making the diagnosis of pneumonia. The early use of digitalis has been shown to reduce mortality, and is advised. It may be given in the form of a standard tincture, of which a total amount of 30 c. c. (1 fluid ounce) should usually be given. The following schedule may be followed.

If seen on the first or second day:

Day of digitalis therapy-----	1	2	3	4	5	6	7	8	9
Total amount of standard tincture to be given in divided doses on the days indicated....	5	5	0	5	5	0	0	5	5
Minims-----	lxxv	lxxv	0	lxxv	lxxv	0	0	lxxv	lxxv

If seen on the third day, or later:

Day of digitalis therapy-----	1	2	3	4	5	6	7
Total amount of standard tincture to be given in divided doses (c. c.)-----	10	10	0	5	0	0	5
Minims-----	cl	cl	0	lxxv	0	0	lxxv

The hospitals should supply themselves with a standard tincture of digitalis. Do not use pills which are insoluble. Other stimulants, notably citrated caffeine and camphorated oil, may be used by hypodermic injection when collapse occurs or is imminent. The use of strychnine has not been shown to be of value.

11. Morphine is of great value to control severe coughing, to relieve the pain of pleuritis, and to secure rest for the patient. It should be used without hesitation. For the troublesome tympanites that frequently occur, turpentine stupes, given while a small catheter is inserted in the rectum, are of value.

12. Most careful attention must be paid to the physical signs, particularly with relation to spread of the consolidation and to fluid in the chest. When the physical signs suggest fluid exploratory puncture, the microscopic and bacteriological examination of the fluid obtained should be performed promptly. Exploratory respiration is a simple procedure, with little danger or discomfort to the patient. Local anesthesia may be induced by freezing or by intracutaneous and subcutaneous injection of cocaine or novocaine. When clear or even slight turbid fluid is obtained, even when the infecting organisms are demonstrated in the fluid, treatment by repeated aspiration with the Potain aspirator is followed by the best results. When purulent fluid is found, or in cases where fluid previously clear becomes purulent, operation is advised, with postoperative measures necessary to insure free drainage.

13. Convalescence must be managed with care, both as to the condition of the patient and as to his transmitting the disease to others. Development of pleural exudate late in the disease, or during convalescence, is not uncommon, and frequent physical examination must not be neglected. Relapse or spread may also occur after the temperature has been normal for several days, and the patient should not be permitted to sit up or move about until 7 to 10 days have elapsed. During this period isolation should be practiced as during the acute stage of the disease. The use of mildly antiseptic solutions in the mouth and nasal passages is of value in reducing the number of carriers. Patients should not be allowed to mingle with other patients, and should not be evacuated until all signs of infection of the respiratory tract have disappeared.

14. Recovery and return to duty will be slow. The final stages of recovery will best be provided for in convalescent camps. No patient who has had pneumonia should be evacuated to a convalescent camp until his temperature has been normal for at least two weeks, and in cases where the infection has been severe or prolonged this period will be materially increased. The patient should be free from cough and other physical signs should be normal.

WALTER D. McCaw,

Colonel, Medical Corps, Chief Surgeon.

Circular No. 52.

AMERICAN EXPEDITIONARY FORCES,

October 22, 1918.

I. *Recommendations for appointments.*—The following paragraphs of a letter, adjutant general's office, is quoted:

1. With reference to the cases of * * * and * * * action has been taken to withdraw the recommendation contained in courier letters from these headquarters to The Adjutant General of the Army, that these men be appointed as officers in the United States Army.

2. Chiefs of staff departments and other services are expected to take the necessary steps to insure that only persons fully qualified are recommended by them for appointment, and it is desired that greater care be exercised in the future that recommendations from the office of the chief surgeon conform to the above requirements.

II. *X-ray therapy.*—The following hospitals are designated as being the only ones qualified, at present, to administer X-ray therapy: Base Hospitals Nos. 15, 28, 32, 20, 18, 9, 6, American Red Cross Military Hospital No. 1.

When it becomes necessary to administer X-ray therapy, either because it is immediately indicated or in the event that a patient requiring it need not be evacuated to the United States, and he is in some other hospital, he will be transferred to one of the above-designated hospitals.

III. *Base Hospital No. 8.*—Hospital trains and detachments of patients hitherto ordered to Base Hospital No. 8 will hereafter be directed to report to the commanding officer hospital center, Savenay.

IV. *List of B and C class personnel.*—The commanding officer of each Medical Department unit will forward to this office, with the least practicable delay, a nominal list, showing all B and C class personnel, with branch of service, now on duty with his unit, with statement of the number returned to duty reclassified as class A.

Attention is invited to the fact that paragraph 5, section 1, General Order No. 41, c. s., requires reexamination of all class B officers and soldiers at least every two months. This order is apparently not being complied with.

V. *Soldiers qualified as opticians.*—The commanding officer of each Medical Department unit will report by mail to this office, with the least practicable delay, the names of all Medical Department soldiers belonging to his command who are qualified as opticians.

VI. *Telegrams to be numbered serially.*—The adjutant general informs this office that telegrams are frequently received from base hospitals, especially at hospital centers, in which the particular unit sending the telegram can not be identified. In order to avoid this, each base hospital should number its telegrams serially and state immediately after the serial number the numerical designation, as, for example, the first telegram of Base Hospital No. 25 under this system, would begin "1 BH 25 Allerey."

This would not be necessary, however, where the commanding officer of a hospital center preferred to send all telegrams through his office and signed with his name. Only one serial list for the center would be kept in such case, and the telegrams would begin, "1 HC Allerey."

VII. *Nurses' names.*—Commanding officers of all medical units to which nurses are attached will, if they have not already furnished this information, forward to this office the name in full of all nurses of the Regular Army Corps, and the places from which they were assigned, as given in original letters of appointment. Special attention will be given to the correct spelling of the names of nurses and places.

VIII. *Change of station of nurses.*—When making a change of station, either for temporary or permanent duty, the letter of appointment of the nurse, with the required information as to pay, etc., indorsed thereon, should be carried by her and delivered to the commanding officer or chief nurse at her new station. Failure to carry out this procedure in the past has caused difficulties in the matter of the pay of the nurse.

In order to avoid delay in the receipt of baggage, nurses who are traveling under orders should be instructed to give it their personal attention when changing trains.

IX. *Amendment to Circular No. 45.*—Paragraph 8, Section I, Circular 45, office of chief surgeon, c. s., is amended to read:

Medical officers, who are compelled to administer antitetanus serum by reason of the failure of medical officers through whom the patient has passed to administer the same, will make immediate report of said failure, with sufficient data to establish the circumstances of the omission, directly to the surgeon of the division from which the case came, or in case the patient belongs to a higher or separate organization to the senior medical officer of that organization.

X. *Requisitions for medical supplies.*—All organizations in base section No. 1, other than base hospitals and hospital center depots, will submit their requisitions for medical supplies to the surgeon, base section No. 1, A. P. O. No. 701, and will hereafter submit none direct to intermediate medical supply depot No. 3, Cosne.

Upon the approval of the section surgeon, the requisitions will be sent to the medical supply depot, base section No. 1, for issue.

XI. *Address of American statistical section.*—The address of the American statistical section, to which reports of French military patients hospitalized in American military hospitals in the French zone of the armies are sent, has been changed from No. 10 Rue Saint Anne, Paris, to No. 7 Rue Tilsitt, Paris. Hereafter all American Expeditionary Forces hospitals in the French zone of the armies will send reports to the latter address.

XII. *Identification tags.*—The removal of identification tags from the persons of patients during the process of evacuating them from the front, especially from groups of patients who have been bathed as an antagas measure or as a routine to admission to hospital, has caused the erroneous return of soldiers' identification tags to others. In one recent instance a soldier's tags were erroneously placed on another who subsequently died and was buried and reported as dead under the name of the former. This one mistake gave rise to much needless grief and administrative difficulties.

The removal of identification tags as a routine while bathing patients either, as an antagas measure or on admission to hospitals, is prohibited. When for any reason, other than the above, it becomes necessary to remove a soldier's identification tags the utmost care will be exercised in preventing the possibility of their being placed on another.

XIII. *Base Hospital No. 66.*—Base Hospital No. 66 is hereby detached from hospital center, Bazoilles, and will operate as a base hospital directly under the chief surgeon, A. E. F.

WALTER D. McCaw,
Colonel, Medical Corps, Chief Surgeon.

Circular No. 53:

AMERICAN EXPEDITIONARY FORCES,
October 29, 1918.

I. The following extract from assistant chief of staff, G-4, is published for information of all concerned:

1. A serious situation has arisen with regard to the telegraph and telephone systems of the American Expeditionary Forces, and attention is directed to the necessity of exercising the most rigid economy in their use, particularly the long-distance telephone service. During the past three months, the use of the long-distance telephone service has increased 70 per cent, and during the same period it has been possible, through the most strenuous efforts, to increase the telephone and telegraph services only 25 per cent. Until recently, there has been a margin of safety in the facilities, but this has now been entirely absorbed by the tremendous increase in the number of telegrams and long-distance telephone calls. If this increase continues, a very serious congestion will soon result.

2. It is not desired to issue any hard and fast rules to restrict the use of the long-distance telephone and telegraph. It is believed, however, that a reading of paragraph 1 above explains fully the present situation, and the necessity of some action to reduce the number of long-distance telephone calls and telegrams sent. It is desired that this reduction be made by the chiefs of the services, themselves.

3. The following means of communication are now available, and are arranged in the order in which they should be used:

- (a) Mail.
- (b) Courier and messenger service.
- (c) Telegraph.
- (d) Long-distance telephone service.

4. It is desired that each chief of a service prepare and put into operation at once a system which will reduce the number of long-distance telephone calls and telegrams in use by his service. It is desired that a memorandum be sent to this office (G-4), giving an outline of the system devised and the means adopted for its execution.

It is desired that every effort be made to use the mail, courier, and messenger service wherever possible among the Medical Department units, and it is thought that, except in immediate emergency, any message which can be delivered within 24 hours should be sent by this service rather than by telegraph or telephone. There will be certain exceptions to this rule, such as the weekly report on Form 211, which must be consolidated in one office and then forwarded on to another office for consolidation, thereby consuming three days for delivery to this office instead of one. In cases such as this the telegraph will be used.

II. *Daily and weekly telegraphic bed report.*—With regard to daily telegraphic bed report from base hospitals and the weekly telegraphic bed report from camp hospitals, constancy with reference to personnel should now be eliminated. This refers to item E. Hereafter item E will be designated to indicate the total number of beds which can be utilized in the event of emergency, consideration being given to bed space in tentage, halls, and corridors of the hospitals.

III. *Unloading of freight cars.*—The French railways are taxed to their utmost to meet the demands made upon them. Facility of transport is vital to the American Expeditionary Forces. Reports have been made that cars containing medical supplies have been delayed at destination pending unloading.

It is desired that all Medical Department organizations having to do with such supplies take the necessary steps to prevent the least delay in the unloading and release of cars. Orders require that this be done within 24 hours.

IV. *Commissions in the Sanitary Corps.*—With reference to Bulletin No. 30, c. s., these headquarters, the attention of all medical officers is invited to the fact that the Medical Department, within the next few months, will have urgent need of large numbers of well-qualified soldiers at present in the Medical Department who may be suitable for commission in the Sanitary Corps. It is desired that, before recommending a soldier for commission in another department, the commanding officer of a Medical Department unit satisfy himself that the soldier recommended is better fitted for commission in some other branch of the service than in the Sanitary Corps.

V. *Nurses*.—With reference to paragraph 7, Circular 48, the policy outlined therein has been changed and following adopted:

"Nurses marrying in France will be sent to base section No. 3 for duty, and no leave to visit France will be allowed after they shall have reported in England."

VI. *Vocational education*.—There is some misunderstanding among disabled soldiers affecting the matters of vocational education. It is important that erroneous ideas be corrected, and medical officers are urged to set the men straight. The terms of the following letter should be understood and communicated to disabled soldiers by medical officers and the facts in the letter should be placed on the bulletin board in each hospital.

Subject: The vocational rehabilitation act (Smith-Sears Act) to provide vocational education for disabled persons discharged from the military or naval forces.

Question 1. What is the vocational rehabilitation act?

Answer. It is an act of Congress appropriating the funds and providing the means for giving every disabled person discharged from the military or naval forces a vocational education free.

Question 2. Who is entitled to a vocational education under the provision of this act?

Answer. Every war-disabled person whose physical disability entitles him to any compensation under the regulations of the Bureau of War Risk Insurance.

Question 3. Will the person who elects to secure vocational training under the provision of this act receive a monthly compensation during the period of time he is pursuing his vocational training?

Answer. Yes. He will receive a monthly compensation equal to the amount of his monthly pay for the last month of his active service, or the amount of his monthly compensation allowed by the Bureau of War Risk Insurance, whichever amount is the greater. His family will receive the family allowance in the same manner as if he were an enlisted man.

Question 4. Will the fact that he has secured a vocational education, and thereby increased his earning power, in any way change the amount of compensation he should receive from the Bureau of War Risk Insurance?

Answer. No. The compensation he will receive from the Bureau of War Risk Insurance is calculated on the basis of his physical disability and not on the basis of his economic efficiency. A vocational education will not lower his compensation from the war risk insurance.

Question 5. Under whose supervision and administration will the vocational training be given?

Answer. The Federal Board for Vocational Education, of Washington.

Question 6. What types of vocational education will the Federal Board for Vocational Education provide for these men?

Answer. Training for every vocation will be provided. Any vocation in the fields of industrial, commercial, agricultural, technical, and professional education is open for him. His past vocational experience, his physical disabilities, his own desires and aptitudes will determine the vocation he elects, in which to take his training. He will be given scientific information concerning the economic advantages of the different vocations by technical experts.

Question 7. Where will the training be given?

Answer. In the vocational and technical schools, colleges, and universities of the United States. All courses will be under the supervision of the Federal Board for Vocational Education.

(Signed) EDWIN L. HOLTON,
Special agent, Federal Board for Vocational Education.

VII. *Change in paragraph II, Circular No. 52, office of chief surgeon.*

The list of hospitals designated in Paragraph II, Circular 52, office of chief surgeon, October 22, 1916, as being the only ones qualified, at present, to administer X-ray therapy, has been changed as follows: Base hospitals Nos. 6, 7, 9, 15, 20, 28, 30, 32, 38, 115, 116, Mars hospital center, American Red Cross Military Hospital No. 1.

WALTER D. McCaw,
Colonel, Medical Corps, Chief Surgeon.

Circular No. 54.

AMERICAN EXPEDITIONARY FORCES,
November 9, 1918.

I. *Data necessary for promotion*.—Attention is called to the requirement of General Order 162, A. E. F., 1918, that a statement of the current physical condition of an officer shall be made as an accompaniment to any request or recommendation for promotion. This is mandatory, and if the certification is not made it must involve annoying delay to everyone concerned.

Papers covering promotions must be acted on by superior local medical authority prior to submission to this office.

Recommendations for promotion of officers of the Sanitary Corps will be made on the blank for character of service and qualifications, as in the case of medical, dental, and veterinary officers. The only citation which requires omission in this blank is the fourth, which specified the medical school from which graduated. However, should the officer be a graduate of a high school, college, or university, the citation may be made under this paragraph.

II. *Travel orders.*—Complaint has been made that hospitals evacuating patients to other hospitals have failed to furnish attendants accompanying them with sufficient copies of travel orders to get commutation of rations and return transportation. In order to avoid unnecessary duplication of work at the hospital where these patients are received, hospitals will furnish attendants the necessary copies of orders for commutation and return transportation.

III. *Claims for damages to French property.*—Claims made for damages to French property have been erroneously paid out of hospital fund. Such payments are not to be made in the future, either out of hospital fund or out of Medical Department appropriations.

In this connection, attention is invited to section 4, paragraph E, General Orders, No. 50, general headquarters, A. E. F., dated March 30, 1918, which establishes a renting, requisition, and claims service for the American Expeditionary Forces and outlines procedure for handling damage claims; and attention is also invited to section 4, General Orders, No. 78, general headquarters, A. E. F., dated May 25, 1918, which quotes an act of Congress appropriating specific sums for the payment of such damages.

IV. *Middle initial or number to be given in reports.*—Attention is invited to the following letter from the chief paymaster, United States Marines. Care will be taken to follow the instructions as requested in this letter:

1. Numerous cases have arisen in which we are unable to distinguish certain men on account of no middle initial being given in your reports to this office of men returning to the United States on account of disability.

2. It is requested that whenever possible the middle initial be given, or in the absence of such information that the man's number be given. Whenever it is impossible to give either the number or the initial, it is requested that the company organization be designated instead of regimental organization.

V. *Property of French soldiers.*—The chief of the French mission states that the provisions of Circular 31, office chief surgeon, May 23, 1918, regarding the personal property of French soldiers who die in American hospitals, are not being carried out. The attention of all Medical Department organizations is called to this circular, and the directions contained therein will be carefully and strictly followed in the future.

VI. *Religion of patient to be entered on field medical card.*—Attention is invited to paragraph 8, Circular 41, office chief surgeon, July 22, 1918, which provides that, as soon as practicable, the religion of every patient admitted to a hospital ward will be ascertained by the ward medical officer and appropriate entry thereon made on the patient's field medical card. These instructions will be carefully followed, as it has been reported that this is very often neglected.

VII. *Reporting of French military patients.*—The attention of all commanding officers of American hospitals in the zone of the interior is again directed to instructions governing the reporting of French military patients to the Franco-American section of the region and not to the American statistical section, No. 7 Rue Tilsitt, Paris.

VIII. *Nurses and civilians.*—In many cases the number of nurses and civilians assigned to duty have not been entered on weekly strength return of hospitals. In future, care will be exercised to have these returns complete in every respect.

IX. *Nurses' uniform.*—The uniform of all nurses, including the cap, must conform in all respects to that of the Army Nurse Corps. The use of the Red Cross cap will be discontinued by the reserve nurses of the Army Nurse Corps.

X. *Sick leave for nurses, Army Nurse Corps.*—Bulletin 43, War Department, July 22, 1918, states that nurses shall be entitled to sick leave with pay not exceeding 30 days in any one calendar year in cases of illness or injury incurred in the line of duty. Nurses while so absent are entitled to commutation of rations at rate fixed by Army Regulations. When

sent to convalescent homes or hotels provided by the American Red Cross, nurses will be charged for subsistence at the same rate as will be paid to them by the Government as commutation of rations.

XI. *Original papers on the surgery of the war.*—The editor of The Military Surgeon is anxious to secure original papers on the surgery of the war, especially reports on regional surgeries. Medical officers of the American Expeditionary Forces are requested, when forwarding papers to this office for publication in the United States, to state if they wish them to be published in The Military Surgeon. This will also apply to professional papers other than surgical.

XII. *Requisitions for medical supplies.*—All organizations in base section No. 2, other than base hospitals and hospital center depots, will submit their requisitions for medical supplies to the surgeon, base section No. 2, A. P. O. No. 705, and will hereafter submit none direct to intermediate medical supply depot No. 3, Cosne.

Upon the approval of the section surgeon, the requisitions will be sent to the medical supply depot, base section No. 2, for issue.

XIII. *Applications for transfer.*—In order that applications for transfer from one branch of the service to another, forwarded by officers and soldiers while sick in hospital, may be acted upon intelligently, the following information will be indorsed upon all such applications forwarded to higher authority for action:

(a) Whether the applicant is a patient; and if so,

(b) The nature of his disability, whether wounds or sickness, with a brief description thereof.

(c) Probable date when applicant will be returned to duty.

(d) The class in which he will probably be discharged from the hospital.

XIV. Alphabetical list of officers on duty in the office of the chief surgeon showing rank, department, and telephone number:

Officer	Rank	Department	Telephone No.	Officer	Rank	Department	Telephone No.
McCaw, Walter D.	Colonel	Chief surgeon	549	Brown, John D.	First lieutenant	Dental	256
Glennan, James D.	Brigadier general	Hospital	51-1	Calder, J. W.	do	Transportation	50-2
Winter, Francis A.	Colonel	Assistant chief surgeon	57	Douglas, Malcolm C.	do	do	50-2
Fife, James D.	do	Hospital	55-1	Evans, John E.	do	Hospital	51-2
Fisher, Henry C.	do	Inspection	57	Emerson Bertrand, Jr.	do	Supply	257-2
Oliver, Robert T.	do	Dental	50-1	Fenton, William J.	do	Det.	448-2
Shaw, Henry A.	do	Sanitation	57-1	Poster, Elliott O.	do	Finance and accounting	538-1
Whitcomb, Clement C.	do	Supply	261-2	Goodyear, Russell W.	do	do	538-1
Aitken, John J.	Lieutenant colonel	Veterinary	252-1	Hanford, Harry C.	do	Hospital	51-2
Clarke, Howard	do	Transportation	256-1	Mael, Jesse H.	do	Personnel	253-1
Culler, Robert M.	do	do	256-1	Mannix, Daniel E.	do	do	246-2
Harmon, Daniel W.	do	Sick and wounded	524-1	Mims, Martin D.	do	Hospital	51-2
Johnson, Thomas H.	do	Hospital	468-1	Mueller, Frederick W.	do	do	55-1
McDiarmid, Norman L.	do	Supply	257-1	Murray, Joseph E.	do	Transportation	256-2
Shepard, John L.	do	Hospital	569-1	Ross, Frank A.	do	Sick and wounded	524-1
Thearle, William H.	do	Personnel	253-1	Yohe, Edward L.	do	Dental	256
Welles, Edward M., Jr.	do	do	253-1	Russell, George E.	do	Hospital	51-2
White, David S.	do	Veterinary	252-1	Rich, Harold	do	do	51-2
Weed, Frank W.	do	Hospital	569-1	de Grange, Garrett S., Jr.	do	do	51-2
Bemis, Harold E.	Major	Veterinary	252-1	Skelly, Patrick J.	do	Sick and wounded	524-1
Dickson, Robert A.	do	Administration	255	Engel, William E.	do	Records	59-1
Emerson, Haven	do	Sanitation	59-2	Bibby, Henry L.	Captain	Proc.	448-1
Fleiden, John S. C., Jr.	do	Supply	257-2	Delafield, Robert H.	Second lieutenant	Sick and wounded	524-1
Rice, William S.	do	Dental	50-1	Duffield, Thomas J.	do	Sanitation	59-2
Williams, Linsly R.	do	Sanitation	59-2	Powell, George E.	do	Veterinary	533
Thompson, Richard K.	Captain	Dental	50-1	McComb, Robert P.	do	do	533
Whitcomb, Walter D.	do	Finance and accounting	538	Proctor, Arthur W.	do	Supply	261-2
Barney, James E.	First lieutenant	Transportation	50-2	Scott, Ernest E.	do	Hospital	269-1
Berry Eugene J.	do	Finance and accounting	538	Benett, Lowell	Second lieutenant	Reference library	
Bolton Ray	do	Veterinary	533	Bissonette, Geo. A.	do	Transportation	50-2
				Nelson Arthur E.	do	Sick and wounded	524-1

WALTER D. McCaw,
Colonel, Medical Corps, Chief Surgeon.

Circular No. 55:

AMERICAN EXPEDITIONARY FORCES,
December 12, 1918.DISTRIBUTION OF MEDICAL SUPPLIES IN THE AMERICAN EXPEDITIONARY FORCES OUTLINING
LINES OF SUPPLY AND DECENTRALIZATION OF BOTH REQUISITIONS AND SUPPLIES

I. The following outline of medical supply department activities from front to rear will obtain in the future operations of this department.

(a) *Divisional medical supply dumps*.—On a basis of one to each division.

Activities: To supply divisional troops and to stock only such items as are needed by combat divisions. Items of stock carried to be identical in all divisional supply dumps the amount of each item to be carried and controlled by a maximum stock list.

(b) *Army park medical supply dumps*.—On a basis of one to each army corps.

Activities: To supply divisional medical supply dumps and in emergency to surrounding medical units. Stock items to be the same as those carried by divisional medical supply dumps. The amount of stock to be carried on items to be based on the number of combat divisions concerned in the sector supplied.

(c) *Army medical supply depots*.—On a basis of one to each Army.

Activities: To supply army park medical supply dumps, evacuation hospitals, field hospitals, ambulance companies, mobile hospitals, mobile surgical units, veterinary field units, and such other units as specially designated. Stock items to be carried should meet all the requirements of the units concerned and should also be based on a maximum stock list.

(d) *Services of Supply medical supply depots*.—Number prescribed by the chief surgeon, A. E. F.

Activities: To supply army medical supply depots and designated Services of Supply medical units. The stock in these Services of Supply depots in advance positions to fully cover all the items carried at army medical supply depots, as well as the surrounding Services of Supply medical units.

(e) *Controlled stores*.—Includes all medical supplies in storage at base ports or other designated Services of Supply depots, the issues from which are under the direct control of the chief surgeon, A. E. F.

Activities: To furnish supplies to all depots and initial equipment to new units being installed.

(f) *Medical supply depots at hospital centers*.—Number prescribed by the chief surgeon A. E. F.

Activities: To furnish supplies to the hospitals of the group concerned to any other units specially designated by the chief surgeon, A. E. F. Hospital centers not having depots should consolidate requisitions and forward same direct to the chief surgeon, A. E. F., A. P. O. 717.

Depot control.—While the chief surgeon, A. E. F., controls all activities of the Medical Department, the immediate control of the army dumps and army medical supply depots is vested in the chief surgeon of the army concerned. The immediate control of all other medical supply depots being under the chief surgeon, A. E. F.

II. *Decentralization of requisitions*.—Hereafter all requisitions, except those specially exempted below originating in the Services of Supply will be acted upon by the chief surgeon of the section concerned, who will modify the requisition and forward same to designated depot for issue.

This modification will be final and any question thereto should be taken up by the depot concerned with the surgeon of the section approving the requisition.

Exceptions.—Requisitions from medical supply depots and medical supply depots at hospital centers and for initial equipment of medical units will be sent direct to the office of the chief surgeon, A. E. F., A. P. O. 717, for his action.

Requisitions for laboratory supplies, except from medical supply depots, will be sent direct to the director, central laboratory, A. P. O. 721, Dijon, for his action; same will then be forwarded to the designated depot.

Requisitions for X-ray supplies covering initial equipment—i. e., base hospital X-ray outfits, portable X-ray outfits and bedside units—will be forwarded to technical consultant, Roentgenology, A. P. O. 702.

X-ray supplies such as plates, chemicals, etc., will be included in requisitions for medical supplies and referred to the section surgeon, but they must appear under separate heading, X-ray supplies.

Requisitions for veterinary supplies follow the course of medical requisitions except for initial equipment of units, which will be forwarded to the chief surgeon, A. E. F., direct.

Requisitions for dental supplies follow the course of medical requisitions except for initial equipment of base hospitals; i. e., base dental outfits, which will be sent direct to chief surgeon, A. E. F.

III. Pending the installation of additional depots, the following sections will be supplied by medical supply depots as follows:

Base section 1, 4, 5, by base medical supply depot No. 1, St. Nazaire.

Base sections 2, 6, 7, by base medical supply depot No. 2, Bordeaux.

Intermediate section and Paris district by intermediate medical supply depot No. 3, Cosne.

Advance section, Services of Supply, by advance medical supply depot No. 1, Is-sur-Tille.

Surgeons of sections will take the necessary steps to notify the unit now in their sections and new units arriving as to the proper channels for medical supply requisitions as above outlined.

IV. This circular does not modify the method of handling requisitions in combat sectors.

WALTER D. McCaw,

Colonel, Medical Corps, Chief Surgeon.

Circular No. 56.

AMERICAN EXPEDITIONARY FORCES,

November 19, 1918.

I. *Made-up surgical dressings.*—Because of the immense amount of devoted labor given by the women of America, through the American Red Cross, there is now available in France a sufficient supply of made-up surgical dressings to warrant the issue to and use in all hospitals of these prepared dressings.

It is desired therefore that requisitions be submitted for these dressings and that requisitions for gauze, plain, be consequently reduced. These dressings are of two classes:

First, already sterilized.—The supply of this type is limited, and issue will be made to field and evacuation hospitals, and they should be used only in times of stress or where opportunities for sterilization are inadequate. Requisitions for these dressings should call for "Dressings for evacuation hospital use, sterilized."

In ordinary times dressings of the following type should be used:

Second, prepared and wrapped ready for sterilization but not sterile.—These supplies are stocked in all medical supply depots and dumps and in Red Cross storehouses. They should ordinarily be obtained from the medical supply depot by original requisitions. Case lots should be asked for. For the initial stock, requisition should be submitted to this office. The attached list approximates 10 carloads, and requisition may be submitted in the form of a request for 10 carloads, or a specified portion thereof. (In this case the shipment will be prorated.) Subsequent requisitions should call for case lots of dressings needed:

10-carload lot of assorted surgical dressings

[To be used as basis for requisitions by medical supply depots, A. E. F.]

	Number of cases	Dressings
Dressing used as:		
Sponges—		
Gauze wipes—		
2 by 2.....	10	200,000
4 by 4.....	23	207,000
Gauze finger sponges.....	8	128,000
Gauze squares, 9 by 9.....	2	72,000
Folded gauze strips.....	10	45,000
		652,000
Compresses—		
Sterile dressing pads, 8 by 4.....	20	120,000
Gauze compresses—		
4 by 4.....	20	127,000
9 by 9.....	20	66,000
		313,000
Packing and padding—		
Gauze rolls, 5 yards by 4½.....	12	4,200
Gauze rolls 3 yards by 4½.....	20	25,000
Laparotomy pads—		
12 by 12.....	2	1,300
6 by 6.....	1	1,000
4 by 16.....	2	1,400
		32,900
Absorbent—		
U. D. pads, type 1—		
Cotton, 8 by 12.....	40	22,000
Oakum, 8 by 12.....	12	4,680
U. D. pads, type 1—		
Cotton, 14 by 20.....	40	8,000
Oakum, 14 by 20.....	15	2,250
U. D. pads type 1, cotton, 12 by 24.....	80	14,400
Split irrigating pads, 21 by 16.....	10	1,000
		52,330
Bed pads—		
U. D. pads, type 2—		
11½ by 18.....	40	10,800
18 by 23.....	60	6,000
		16,800
Drains—Gauze packing, 2 by 1 yard, ½ by 1 yard.....	5	10,000
Body bandages:		
Abdomen—		
Many-tailed bandages, 48 by 12.....	6	4,800
Abdominal bandages—		
Muslin, 48 by 18.....	8	4,000
Flannel, 52 by 12.....	4	1,000
Scutetus, flannel.....	10	4,000
		13,800
Perineal, T bandages, 53 by 7.....	5	3,500
Head and chin, four-tailed bandages, 36 by 8.....	3	3,000
Arm and various slings.....	25	12,500
Eyes—		
Double-eye bandages.....	4	2,000
Single-eye bandages.....	2	1,000
		3,000
Pneumonia jackets.....	14	1,400
Accessories used with splints:		
Supports—		
Support slings—		
No. 1, 8 by 21.....	2	3,200
No. 2, 5½ by 16.....	2	5,000
No. 3, 7 by 23.....	1	1,400
Rubber cloth support slings (wooden ends), 8 by 24.....	1½	250
Canvas support slings (wooden ends), 8 by 24.....	1½	250
Canvas swatches, 18 by 22.....	1½	100
Straps and buckles—		
1½ by 4 yards.....	1	4,000
1½ by 2 yards.....	1	2,400
Heel rings.....	1	630
		17,230

10-carload lot of assorted surgical dressings—Continued
 [To be used as basis for requisitions by medical supply depots, A. E. F.]

	Num- ber of cases	Dressings
<i>Accessories used with splints—Continued.</i>		
For traction—		
Anklets.....	1	500
Elbow traction bands.....	1	1,000
Traction bands, flannel, 10 by 5, 16 by 7, 23 by 7.....	3	5,000
Adhesive plaster.....	10	500
Shot bags *.....	1	22,000
Canvas weight bags.....	1	1,820
		28,820
<i>Accessories used with plaster:</i>		
Sheet wading, 5-inch.....	30	4,500
Crinoline—		
5-inch.....	10	10,000
Bolts.....	2	
Felt, 100 yards.....	1	290
Canvas hammocks, 20 by 42.....	1	
		14,890
<i>Bandages:</i>		
Gauze bandages, 3 inches by 5 yards.....	15	37,500
Muslin bandages, bias—		
3-inch.....	2	1,200
4-inch.....	2	1,200
5-inch.....	1	600
6-inch.....	4	3,200
Muslin bandages, straights—		
5 by 5.....	8	8,000
4 by 5.....	6	4,800
5 by 5.....	1	600
Flannel bandages, straights—		
3 by 5.....	3	3,000
4 by 5.....	2	1,600
Jackinette, 500 yards.....	1	61,700

* In stock, but not being replaced.

II. *Reconstruction aides.*—Reconstruction aides are civil employees under contract with the Surgeon General. They are subject to the orders of the commanding officer of the units to which assigned and will be under the direct charge of the chief nurse. They are entitled to such pay and emoluments as are set forth in contracts.

Their especial function is to carry out the instructions of the medical staff in the rehabilitation of wounded in methods of physical and occupational therapy.

When assigned to duty at hospitals they are subject to the same regulations which govern nurses, and when their services are not required in their special work they may be temporarily assigned to duty as nurses' aides.

The necessary reports will be made by the chief nurse and forwarded through regular channels.

III. *Expendable property.*—The following articles of medical property will be considered expendable property: Crutches, canes, and splints of all kinds.

To expedite the evacuation of patients, commanding officers of hospitals and hospital trains are authorized to exchange bath robes (convalescents' gowns), blankets, liners, pajama coats, and pajama trousers on a numerical basis except where it is found to be more practicable to transfer the property by exchange of invoices and receipts.

WALTER D. McCaw,
Colonel, Medical Corps, Chief Surgeon.

Circular No. 57.

AMERICAN EXPEDITIONARY FORCES,
November 20, 1918.

I. *Duties of professional consultants.*—(1) The duties of the professional consultants will be to supervise the clinical work of the American Expeditionary Forces. They will be assigned to hospital centers, districts, armies, army corps, and divisions, as the necessity demands, on recommendation of the chief consultant of their respective services, by the proper military authority.

(2) In order that the individual consultant may perform his duties effectively, he will make frequent visits to the hospitals or other medical organizations in his territory, as may be required. He shall spend so much time in each hospital as in his judgment may be necessary in order to acquaint himself thoroughly with the character and quality of the work done therein.

(3) It is the duty of the consultant to supervise the professional work, as to his department, of the organization or organizations to which he is assigned. He will give advice, instruction, and actual demonstrations as to the best and most efficacious methods of treatment in order that the work of his department may conform to the recognized and accepted standards of the best civil and military practice.

He will make recommendations to the commanding officer as to the ability and professional fitness of individual medical officers of his department. The commanding officer will take the necessary steps to carry the recommendations of the consultant into effect. A copy of the recommendations of the consultant will be forwarded to the senior consultant for his information. In case of difference of opinion between the commanding officer and the consultant, the decision rests with the commanding officer on whom, in all military organizations, the ultimate responsibility rests. This does not interdict the right of appeal to higher military authority.

(4) In order that the supervision and direction of the clinical care of the sick and wounded may be consistent throughout, consultants will recommend to commanding officers of hospitals in their respective areas the names of those suitable for appointment as chiefs of clinical services and specialists in those hospitals.

(5) Consultants will render regular monthly reports of their activities. These reports will embody the nature of the clinical work of the organizations in their jurisdiction, the character and quality of the work, and fitness of individual medical officers in their departments. These reports will be submitted to the senior consultant, through the commanding officer of the hospital center, or in base hospitals operating separately, the commanding officer of the hospital, or through the surgeon of the unit to which they are assigned.

(6) The commanding officers of units in the district assigned to a consultant will afford proper and necessary facilities to the consultant in the performance of his duties.

(7) The consultant will report to the commanding officer immediately on his arrival at, and before his departure from, any unit which is within the sphere of this action.

II. *Assignment of personnel.*—Commanding officers of hospital centers may make such changes of assignment of personnel on duty with units belonging to their centers as may be necessary or desirable. This authority will not be construed to cover personnel belonging to units, such as field hospitals or ambulance company which are not permanently assigned to the center. All changes of assignment made under this authority will be promptly reported to this office.

III. *Class B men.*—Men of class B held at hospitals in accordance with telegraphic instructions, chief surgeons's office, October 25, 1918, will be held as classified men, after disability boards have acted upon them, and not as patients.

IV. *Artificial eyes.*—Four centers have been established where men requiring artificial eyes can best have them fitted. Base Hospital No. 115 at Vichy is the principal center. The others are base optical unit, Medical Department repair shop, Paris; Base Hospital No. 8, Savenay; and Base Hospital No. 29, London. Cases requiring plastics on the eyelids or orbit prior to the fitting of an artificial eye should be routed to Base Hospital No. 113 if practical. Such cases appearing in Paris may be sent to American Red Cross Military Hospitals Nos. 1 or 2.

V. *Trachoma.*—Cases of trachoma which occur among the troops can be treated in the base hospitals, but precautions should be taken to prevent any danger of spread of the disease. Special care of towels and handkerchiefs is most necessary. Severe cases likely to require long treatment with resulting impairment of vision should be classified "D" and routed accordingly.

VI. *Civilian employees.*—(1) Supplementing paragraph 3, Circular No. 45, chief surgeon's office, dated August 13, 1918, commanding officers of hospital centers are directed to report to the office of the chief surgeon (F. and A. Division), all authorities for the employ-

ment of civilians granted by them to date to commanding officers of base hospitals under their command, and also to forward to the same office copies of all similar authorities hereinafter granted by them. Attention of commanding officers of hospital centers is invited to section 3, paragraph 2, General Order No. 32, general headquarters, A. E. F., dated February 13, 1918, and also to section 5, General Order No. 131, general headquarters, A. E. F., dated August 7, 1918, which regulates employment of civilian personnel.

(2) Supplementing section 2, paragraph 1, Circular 16, chief surgeon's office, dated March 28, 1918, and section 1, Circular 23, chief surgeon's office, dated April 22, 1918, commanding officers of hospitals and other units functioning as such, are directed to have payment of civilians, whenever possible, made from the hospital fund and reimbursement to such fund secured in the method provided in section 2, paragraph 1, Circular No. 16, chief surgeon's office. Payment of civilians should be made by Quartermaster Corps disbursing officers only when sufficient balance is not on hand in the hospital fund. Whenever civilians are paid from the hospital fund, the original pay roll, properly signed and executed, with memorandum voucher attached, should be sent to the disbursing officer, Medical Department, office chief surgeon, A. P. O. 717, for reimbursement by one check drawn to the order of the hospital fund. These original rolls should bear the following properly signed certificates:

(a) I certify that I have witnessed the payment of this roll and that the amount paid each employee was such as is set opposite their respective names.

Signature.

(b) I hereby certify that payment of this roll was made from hospital fund, Base Hospital No. -----, and hereby request that said hospital fund be reimbursed the amount of francs -----.

Custodian, Hospital Fund.

VII. *Surgical instruments.*—Any surplus instruments held by medical units will be turned in at once to the instrument repair shop, 11 ter Rue de La Revolte, Paris, France.

The same procedure will obtain where medical units are discontinued. All instruments shipped in compliance with the above instruction will be properly invoiced to commanding officer of the instrument repair shop.

VIII. Paragraph 3, Circular 28, office of chief surgeon, c. s., is amended by substituting the following:

When French and allied military patients are admitted to, discharged from, or die in, American military hospitals in the French zone of the interior, notification of the fact will be sent within 24 hours to the Franco-American section of the region (Service de Sante), on Form 52, which will contain: Surname, Christian name, regiment, serial number, place of enlistment (if possible), nationality, date of admission, source of admission, nature of wound or disease, and, if in line of duty, complications, mode and date of discharge, or date of death and place of burial, name of hospital in which patient is being treated.

IX. *Patients remaining in hospital December 31, 1918.*—A remaining card, Form 52, will be made out for each patient in hospital on December 31. It will be identical with Form 52 as used for completed cases except that in space 16, "Disposition," the entry "Remaining in hospital" will be made, and in space 17, "Date of disposition," the entry "December 31, 1918," will appear.

A nominal check list of these will be made with the word "Supplemental" appearing on the form at the top. The sheet, together with the cards, will be submitted with the regular monthly report for December.

WALTER D. McCaw,
Colonel, Medical Corps, Chief Surgeon.

Circular No. 58:

AMERICAN EXPEDITIONARY FORCES,
December 2, 1918.

I. *Collection of museum material for medical education and research (supplement to Circular No. 42).*—The cessation of hostilities makes necessary the following additional directions concerning the collection, preservation, and shipment of specimens for the Army Medical Museum:

PAR. 2. *Scope*.—Since opportunity is past for obtaining pathologic material showing recent war injuries, efforts will now be made to obtain material showing such injuries in all stages of healing. Serial graphic records by photographs and drawings will be made of typical or otherwise interesting cases. Amputated and resected material will be preserved. Also all lesions from war injuries in cases coming to autopsy. It is believed such specimens will be of inestimable value in the study of the treatment of wounds, gas burns, trench foot, etc.

PAR. 7. *Pathologic specimens*.—(a) To prevent overhardening during long delays which may occur in transporting specimens to the United States, all gross pathologic specimens, after short preliminary fixation in Kaiserling No. 1, if not carried through the entire Kaiserling process, will be placed in fresh Kaiserling No. 1, which contains only 10 per cent of formalin.

PAR. 8. *Shipment*.—To avoid loss during long delays in transit in France, when possible specimens will be shipped by motor transport to concentration points. (See par. 5, Circular 42.) If rail transport must be used, pathologic specimens will be well padded with waste absorbent cotton, moss dressing, or paper, packed closely in kegs, barrels, or casks, which will then be headed and filled with half-strength Kaiserling No. 1 and shipped by "Grand Vitesse." Where large numbers of specimens have been collected and capable packers are not available, application for assistance will be made to the director of laboratories, A. E. F. (museum unit), A. P. O. 721.

PAR. 18. *Photographs*.—By authority first and fourth indorsements, O. C. S. $\frac{200}{1000}$ C. S. O., the Medical Department, through the Signal Corps, now has full authority to make photographs of subjects pertaining to the Medical Department. Commanding officers of hospitals will take immediate steps to procure photographs for illustrating the history of their organizations.

II. *Proceeds from sale of garbage*.—(1) Decision of the judge advocate states that proceeds from the sale of kitchen refuse at hospitals belongs to the hospital funds of the organizations.

(2) Commanding officers are therefore instructed to make contracts locally for the sale of same, and place proceeds therefrom in the hospital funds.

(3) If proceeds previously received have been turned over to the Quartermaster Corps, effort should be made by commanding officers of hospitals to secure refund, either from the local disbursing quartermaster or by sending claims with all details to this office (F. and A. Division).

III. *Camphor*.—Due to the difficulty of obtaining camphor, it is desired that every effort be made to conserve it.

IV. *Return of buildings occupied for hospital purposes*.—No agreement should be made between commanding officers of hospitals and local French authorities for the return of buildings occupied for hospital purposes, as this office has been repeatedly informed by the French central authorities that local authorities are not competent to act on the premises. This transfer should be only done after receiving directions from the chief surgeon of the American Expeditionary Forces in the case of base hospitals, and the section surgeons of the Services of Supply in the case of camp hospitals.

It has been reported to this office that a number of base hospitals have evacuated patients who should not have been moved, with a view to demobilizing the hospitals.

Action such as this will not facilitate the departure of Medical Department units to the United States, but will in fact retard it. Greater care than ever must be exercised in treatment and evacuation of patients. This office will make proper recommendation, when the time arrives, as to ordering the units to the United States.

V. *Medical Department property*.—All officers accountable for Medical Department property who are carrying Red Cross property on their returns are instructed to drop this property from their returns, making a certificate to this effect to the chief surgeon, F. and A. Division, giving the number of the voucher on which the property was dropped.

Although there is no formal accountability for Red Cross property (see par. 3, Circular 3, B. G. and L. O. C., August 28, 1917), responsibility, however, for this class of property rests with the commanding officers of hospitals and other organizations who should be prepared at all times to give and account of the use to which this property has been put.

VI. *Medical journals and books.*—Standard medical journals and books are available in the medical supply depots and the medical research and intelligence department of the Red Cross, Hotel Regina, Paris. Application for such books should be made through the usual channels. Base hospitals will be supplied from the Army stock, and camp and evacuation hospitals from the Red Cross stock. If nonstandard books are not available in one stock, request will be referred, if approved, to the other.

The medical research and intelligence department of the Red Cross, Hotel Regina, Paris, will be glad to review the literature on any special subject in which a medical officer is interested, and to furnish him an abstract of the results. Correspondence may be made direct.

VII. *Repairs or installation of X-ray apparatus.*—In case of repairs needing the attention of an X-ray officer of the Sanitary Corps the commanding officer of the hospital should wire the office of the technical consultant in Roentgenology, A. P. O. 702, who will direct the proper officer to make the repair. A brief, explicit statement of repair needed will expedite service.

In case of portable or bedside transformer, wire the above office for a replacement and send damaged part to medical repair shop No. 1, X-ray division, 11 Bis Avenue de la Revolte, Neuilly, Paris.

No officer for the installation of new equipment will be sent unless the telegram to the above office states that machine is on hand and that current is available.

VIII. *Personnel available for transfer.*—Commanding officers of Medical Department units and detachments will report, by mail, to this office on the 15th and the last day of each month the names of any officers, nurses, or men who can be spared for return to the United States or for duty elsewhere in the American Expeditionary Forces.

IX. *The following information* will be furnished this office, when units are sailing for the United States:

The immediate commanding officer of each medical department formation will make a final return showing all members of the Medical Department present for duty with his organization, on date of departure to the United States.

Division surgeons will make a separate return of all members of the Medical Department serving in their divisions and not included on other returns.

Separate return will be made of all personnel, present for duty, in the following order: Officers of the Medical Corps; officers of the Dental Corps; officers of the Veterinary Corps; all to be listed alphabetically according to grade.

Separate return will be made of all enlisted personnel, present for duty, alphabetically according to grade, the soldier's serial number, name, and rank will be recorded in the following manner:

Serial No.:	Surname:	Christian name:	Rank:
14278	Brown,	William E.	

Separate return will be made of all civilian employees and members of the Army Nurse Corps.

The return will be prepared on letter or cap paper (typewritten). The return will then be forwarded to the chief surgeon, A. E. F., through the base surgeon, who will take such memoranda therefrom as he may require, and will without delay transmit it by informal indorsement to this office.

X. *Sick leave of absence.*—In granting sick leaves of absence under paragraph 2, General Order 7, Services of Supply, c. s., attention of all commanding officers is invited to paragraph 9, General Order 6, General Headquarters, c. s. In this connection, Paris is in the French zone of the armies, and leave should never be granted to visit Paris except in very exceptional cases.

XI. *Travel orders.*—Reports have been received at this office that the commanding officers of base hospitals, in sending men to depot divisions and casual camps, are not complying with the requirements of General Order 111, General Headquarters, c. s. In order that there may be no mistake, the travel orders of officers and soldiers evacuated from hospital not only as of classes B and C, but also of class A, will state clearly the classification to which the officer or man belongs. Especial attention will be given the fact that sufficient

number of orders must accompany each group in order that the commanding officer of the depot division or casual camp may have the proper records immediately on receipt of a man or group of men.

WALTER D. McCaw,
Colonel Medical Corps, Chief Surgeon.

Circular No. 59:

AMERICAN EXPEDITIONARY FORCES,
December 9, 1918.

I. PNEUMOCOCCUS LIPO-VACCINE

1. The following directions for vaccination against lobar pneumonia and for making the necessary records are published for the information and guidance of medical officers of the American Expeditionary Forces.

2. Each cubic centimeter of the pneumococcus lipo-vaccine contains 15,000 million pneumococci of Type I and 15,000 million of Type II. On standing in the cold, some of the fats may separate and cause a precipitate. This will disappear on standing a short time at room temperature.

3. A single dose of 1 c. c. of this vaccine is sufficient. It is especially important that it be given subcutaneously, not intravenously, intramuscularly, or under the fascia. In order to insure this, you will pick up a fold of skin and inject into the subcutaneous tissue of that fold. Practically all the severe reactions that have been reported have been due to neglect of this precaution. The deep injection of this vaccine may lead to fat embolism and defeats the object of the inoculation.

4. No person should be vaccinated who is not perfectly healthy and free from fever. The temperature will be taken before vaccination is begun and, in doubtful cases, the urine should be examined; if fever or any other symptoms of illness are present, the procedure should be postponed. This precaution is necessary to avoid vaccinating men who may be in the incubation stage of a fever. Neither beer nor alcohol in any form should be drunk on the day of treatment. It is advisable to give the vaccine about 4 o'clock in the afternoon, and the men should be required to remain in quarters for 24 hours after the injection.

5. A sick and wounded card is to be made out for each person vaccinated, giving the type of vaccine employed, batch number for its identification, and the dosage. This card is to be marked "For vaccination record only" and sent direct to the office of the chief surgeon, A. E. F., A. P. O. 717. Enter on the service record, date, type, and dose of vaccination.

6. The pneumococcus lipo-vaccine may be obtained by requisition from base laboratories in accordance with paragraph 10, Memorandum No. 21, office chief surgeon, division of laboratories and infectious diseases, September 18, 1918.

7. Vaccination against lobar pneumonia is not compulsory, and the use of pneumococcus lipo-vaccine in the American Expeditionary Forces must be made only with the consent of the patient.

II. TYPHOID LIPO-VACCINE

1. The following information is furnished for the guidance of the medical officers of the American Expeditionary Forces.

2. As rapidly as the supply of triple lipo-vaccine is increased it will be sent in filling requisitions for triple typhoid saline vaccine. Requisitions should be made to the nearest base laboratory in accordance with paragraph 10, Memorandum No. 21, office of chief surgeon, division of laboratories and infectious diseases, September 18, 1918.

3. Triple typhoid lipo-vaccine contains in each cubic centimeter 2,500 million *Bacillus typhosus*, 2,500 million *Bacillus paratyphosus* A; and 2,500 million *Bacillus paratyphosus* B. On standing in the cold some of the fats may separate and cause a precipitate. This will disappear on standing a short time at room temperature.

4. A single dose (not three) of 1 c. c. of the lipo-vaccine is sufficient. It is especially important that this vaccine be given subcutaneously and not intravenously, intramuscularly.

or under the fascia. To insure this, a fold of skin is picked up and the injection made into the subcutaneous tissue of that fold. Practically all the severe reactions that have been reported have been due to neglect of this precaution. The deep injection of the lipo-vaccine defeats the object of its use and in addition may lead to fat embolism.

5. The precautions to be taken regarding the absence of temperature or disease are the same as are given for the typhoid vaccine in Circular No. 16, War Department, office of the Surgeon General, March 20, 1916. It is advisable to give the vaccine about 4 o'clock in the afternoon, and the man should be required to remain in quarters for 24 hours.

6. After the injection, the record of the vaccine should be kept on Form No. 81, that form being modified by writing "Lipo" after "Triple vaccine," and by striking out "First" in the "Dose" column, and by striking out all columns in the "Second" and "Third" doses. The batch number of the vaccine should always be entered on the card.

WALTER D. McCaw,

Colonel, Medical Corps, Chief Surgeon.

Circular No. 60.

AMERICAN EXPEDITIONARY FORCES,
CHIEF SURGEON'S OFFICE, SERVICES OF SUPPLY,
December 16, 1918.

DIPHTHERIA AND DIPHTHERIA CARRIERS IN THE ARMY

I. *Bacillus diphtheriae*.—(a) True diphtheria bacilli when freshly isolated and examined in young cultures (24 hours on Loeffler's blood serum) have fairly typical morphology and staining reactions which usually serve to differentiate them from other organisms.

(b) Their positive identification may be made upon morphology and staining reactions plus cultural characteristics.

(c) *B. diphtheriae* may be divided into two groups—virulent and avirulent—which are indistinguishable from each other morphologically, tinctorially, and culturally, but may be positively differentiated by guinea-pig inoculation.

(d) Practically speaking, an avirulent strain of diphtheria bacilli never acquires virulence, and a virulent strain retains its virulence with great tenacity.

II. *Etiology*.—Clinical diphtheria is produced only by virulent diphtheria bacilli.

III. *Diphtheria bacillus carriers*.—(a) Single throat cultures from healthy individuals of various ages reveal *B. diphtheriae* in 1 per cent to 30 per cent. The average incidence appears to be 3 to 4 per cent.

(b) Among the bacillus carriers the per cent of carriers with virulent bacilli varies greatly, but is commonly found to be 10 to 15 per cent of carriers.

(c) The carrier stage may be temporary or chronic. Sometimes diphtheria bacilli disappear from the throat of a carrier within a few days after they find lodgment there; in other cases they persist for weeks, months, or even years.

(d) If daily cultures are taken from the throats of chronic carriers, very interesting and instructive results may be obtained; (1) Positive cultures may be obtained for a number of consecutive days extending perhaps over weeks. (2) A majority of the cultures may be positive, with occasional negatives interspersed among the positives. (3) A majority of the cultures may be negative, with occasional positive cultures. (4) A carrier who has been giving regularly positive cultures for a number of days may show irregular results for a time and then give entirely negative cultures for a number of successive cultures, to be followed still later by regularly positive cultures, and this condition of affairs may repeat itself many times. (5) The growth of diphtheria bacilli is not confined to the surface of the mucous membrane; colonies have been demonstrated in the depths of the tonsillar tissue, and the condition described under (4) above is probably to be explained by the successive coming to the surface of these deep colonies as the superficial layers of the tonsils are gradually exfoliated. (6) Virulent and avirulent bacilli are rarely, if ever, found in the throat of a carrier at the same time.

IV. *Sterilization of carriers.*—To free carriers of virulent diphtheria, a great number of methods have been tried. The only one which has met with any considerable degree of success in chronic carriers has been tonsillectomy. This will not prove universally successful, as in some cases the nidus may be elsewhere than in the tonsils, as, for example, in the accessory sinuses.

V. *The rôle of carriers in the spread of diphtheria.*—The rôle of carriers who have not been in close contact with an active clinical case of diphtheria in the spread of diphtheria does not seem to be important. This is obvious when it is recalled that 85 to 90 per cent of all carriers harbor only nonvirulent bacilli, and that infection does not readily occur from the remaining 10 to 15 per cent who constitute a possible source of infection for susceptible individuals.

VI. *The detection of carriers.*—A single throat culture from any large number of people would probably reveal less than half the actual number of carriers present. Two cultures, taken with an interval of a week or two between, would probably reveal twice the number of carriers found on a single culturing. If six or seven cultures were taken with an interval of a week or two between cultures, the number of carriers remaining undiscovered would probably be very small. Nasal cultures might show a few additional carriers, but very few.

Isolation of healthy carriers is impracticable because (1) of the labor involved in detecting all the carriers. (2) If all the carriers among any large group of persons were detected, their number would be too great. (3) The only method of sterilizing chronic carriers (tonsillectomy) that has met with much success could hardly be recommended as a routine procedure, and without this many of them will remain carriers indefinitely. (4) They do not constitute a menace serious enough to justify any of the above procedures. (5) Finally, if for any reason an attempt is made to detect and isolate carriers, virulence tests should be performed and the carriers of avirulent organisms should be disregarded.

VII. *The diphtheria patient.*—While the healthy carrier of even virulent diphtheria bacilli does not constitute a serious danger to persons in contact with him, the same can not be said of the individual suffering from clinical diphtheria. The disease is readily transmissible, both by direct contact and by moist discharges from the nose and mouth. Strict isolation of all cases should be carried out and thorough disinfection of all clothing, bedding, and other articles that have been used by the patient subsequent to his infection. It is possible that persons who have recently become carriers by contact with a diphtheria patient may be a greater source of danger in the spread of the disease than the ordinary healthy carrier who has not been recently in contact with the disease; therefore, all those who are in intimate contact with a person at the time of, or just prior to, his development of diphtheria should be isolated until the incubation period of the disease has passed or until they can be shown to be free from the infection by at least two negative throat cultures. All nurses and orderlies in attendance upon cases of diphtheria should be isolated during the whole of the time that they are in charge of such patients and for a period thereafter equal to the incubation period of the disease, or until they are shown free from the infection by at least three successive negative throat cultures at intervals of three days.

VIII. *The incubation period.*—The incubation period of diphtheria is from 2 to 5 days, oftenest 2 days, and under experimental conditions has been found to be short as 24 hours.

IX. *Treatment with diphtheria antitoxin.*—Diphtheria antitoxin given in adequate doses sufficiently early in the diseases will effect a prompt cure in practically 100 per cent of cases. There should be no mortality where antitoxin is given within 24 hours of the development of symptoms. For adults weighing 90 pounds or over, the amount of antitoxin required in the treatment of cases is as follows: Mild cases, 3,000 to 5,000 units; moderate, 5,000 to 10,000 units; severe,^d 10,000 to 20,000 units; malignant, 20,000 to 40,000 units.

Cases of laryngeal diphtheria, moderate cases seen late at the time of the first injection, and cases of diphtheria occurring as a complication of the exanthemata should be classified and treated as "severe" cases.

In all cases a single dose of the proper amount, as indicated in the schedule, is recommended.

^d When given intravenously, one-half the amounts stated.

It is recommended that the methods of administration be as follows:

Mild cases, subcutaneous or intramuscular.

Moderate cases, intramuscular or subcutaneous.

Severe cases, intramuscular or subcutaneous or intravenous.

Malignant cases, intravenous or intramuscular.

Some point on the surface of the body should be chosen for the injection, as where there is an abundance of subcutaneous cellular tissue—the abdomen or infrascapular region. Before the remedy is administered, the skin should be sterilized at the point of injection with tincture of iodine or other disinfectant. The syringe should be thoroughly sterilized. It is better not to employ massage over the point of injection.

THE EARLY ADMINISTRATION OF ANTITOXIN

The earlier the remedy is administered the more certain and rapid is the effect. In cases of any severity where diphtheria is suspected, it is far better to administer the remedy at once, making a culture at the same time, than to delay the treatment until a diagnosis has been made by bacteriologic examination. The first injection should be large enough to control the disease. One large dose given early is far more efficacious than the same amount in divided doses. Severe cases and those in which the administration of antitoxin has been delayed, or cases which are progressive because of an insufficient first dose, should receive a large intravenous injection whenever feasible. In this way the full value of antitoxin is obtained at once, whereas the absorption from the subcutaneous injection is so slow that many hours must elapse before any great amount of antitoxin has found its way into the general circulation. It must be warned to the body temperature and given very gradually.

X. *Anaphylaxis*.—While it must be admitted that anaphylactic shock may follow the administration of diphtheria antitoxin serum and that this danger is slightly greater when the serum is given by the intravenous route than when given subcutaneously or intramuscularly, instances of serious consequences from therapeutic use of diphtheria antitoxin are so rare that there is no justification in withholding antitoxin in clinical diphtheria. Desensitization may with advantage be attempted in cases of known sensitiveness to horse serum.

XI. *Immunity*.—(a) *Natural immunity*: Experience has shown that approximately 50 per cent of mankind are naturally immune against diphtheria. This immunity is due to the presence, naturally, of a small amount of diphtheria antitoxin circulating in the blood. This immunity once established apparently lasts throughout life. The Schick test: The presence of natural or artificial immunity may be determined by the Schick test. This test consists in the intradermal injection of a small amount of diphtheria toxin; if antitoxin is present (natural immunity) the toxin injected will be neutralized and no reaction will follow. If no antitoxin is present (as in a susceptible individual) the toxin will give rise to an inflammatory reaction at the site of inoculation, a positive reaction. Technique of the Schick test. The test consists in the intracutaneous injection of one-fiftieth M. L. D. diphtheria toxin in volume of 0.1 c. c. The M. L. D. (minimum lethal dose) of toxin is that amount which will kill a 250-gram guinea pig in 4 to 5 days. For the injection, a 1 c. c. hypodermic syringe with very small sharp needle is necessary, and the injection may conveniently be made into the skin of forearm.

(b) *Susceptibility*.—It seems highly probable that people who give a negative Schick test may be exposed freely to diphtheria without danger of their contracting the disease, while persons giving a positive Schick test so exposed are likely to contract the disease.

(c) *Active immunization*.—Susceptible individuals may be actively immunized against diphtheria by the injection of toxin-antitoxin mixtures, and such immunity is probably fairly lasting, in some instances persisting throughout life.

(d) *Passive immunization*.—Susceptible individuals may be passively immunized against diphtheria by the injection of antitoxin. Such immunity reaches its maximum degree immediately, if the antitoxin is injected intravenously, and after about 48 hours following subcutaneous injection. Passive immunity following the usual prophylactic dose of 1,000 units of antitoxin gives the individual a temporary immunity against natural infection, but the immunity is transitory, diminishing rapidly and usually lost in ten days or

two weeks. Rarely persons may retain some demonstrable degree of immunity as long as three weeks. Subsequent use of antitoxin for passive immunity in the same individual develops even a briefer protection.

(e) *Prophylactic use of antitoxin.*—Experience has abundantly demonstrated the almost absolute power of a prophylactic injection of antitoxin in preventing the development of diphtheria in persons who have been exposed to the disease. It probably has no effect in preventing the lodgment and growth of bacilli in the throats of such persons, and it is conceivable that the bacilli which have lodged in the throats of such persons might persist and give rise to the disease after the transient immunity conferred by the antitoxin has disappeared. That this frequently happens is not borne out by experience. It is evident, however, from what has been said about natural immunity, that in approximately 50 per cent of persons there is no need of giving prophylactic injections of antitoxin, since this proportion of humans are naturally immune. If prophylactic injections are to be given, it is worth while to perform a preliminary Schick test and give antitoxin only to those who are thus shown to be susceptible by a positive reaction.

XII. *Prevention of spread of diphtheria.*—Undoubtedly the most important measure in preventing the spread of diphtheria is the prompt recognition of cases as soon as they develop, and effective isolation of them. It is undoubtedly true that many cases are not immediately recognized and that they give rise to a spread of the disease among their associates.

At a time when diphtheria is prevalent, frequent throat inspections should be made of all individuals exposed, or who may have been exposed, and any person having a throat that looks at all suspicious should be isolated and regarded as having diphtheria until negative cultures prove that the suspicion is unfounded. This measure alone, if efficiently carried out, will probably serve to prevent any spread of the disease.

XIII. *A typical case of diphtheria.*—It should be borne in mind that not infrequently cases of diphtheria occur in which the typical appearance of the throat is lacking, and the symptoms may be so mild that they may be overlooked. The pharynx in these cases may present a beefy red appearance, with perhaps a few pinhead-sized patches, and the symptoms consist in little more than a feeling of malaise on the part of the patient. The thermometer will usually reveal a slight elevation of temperature, and it is these cases that may escape isolation and by freely mingling with their associates give rise to a spread of the disease.

XIV. *Wholesale measures in dealing with epidemics illogical and valueless.*—There are certain measures that have become so well established in dealing with epidemics of diphtheria that to question them is sure to arouse the antagonism of those whose ideas have become fixed by tradition. These are the wholesale taking of throat cultures and the prophylactic administration of antitoxin. A knowledge of the practical limitations of application of wholesale culturing to organizations or groups among which diphtheria has appeared, and the poverty of actual results in detecting the insignificant incidence of carriers of virulent *B. diphtheria*, should suffice to forbid the practice. Similarly, the uselessness of administering diphtheria antitoxin to insusceptibles and the temporary character of the protection given to susceptibles by passive diphtheria immunization will serve to put an end to the routine use of diphtheria antitoxin without Schick reaction control for prophylactic purposes in an organization where diphtheria has appeared.

XV. *Selective immunization.*—We may next consider the advisability of determining the susceptible individuals, either in a camp or among those who presumably have been most exposed to the danger of infection, and of giving prophylactic doses of antitoxin to those of persons or of applying other precautionary measures to them. The susceptible individuals may be discovered by means of the Schick test. The results may be known at the end of 48 hours. If a camp of 5,000 men be tested, 25 per cent, or 1,250, may be found susceptible, and these are the only ones who run any risk of developing diphtheria and to whom the prophylactic injection of antitoxin could be of any use.

If the Schick test is applied to a small group (those who have been more intimately exposed to the disease), one will have to deal with a proportionately smaller number of individuals.

XVI. *Principles for management of diphtheria outbreak.* In all preventive measures the two main objects to be accomplished should be kept clearly in mind: (I) the protection of the individual; (II) the protection of the community. We should also keep clearly in mind what we consider constitutes the danger to the individual and what, to the community.

I. The danger to the individual is that he may develop diphtheria.

II. The danger to the community, as usually considered, is that diphtheria may be spread by: (a) Diphtheria bacillus carriers; (b) the failure properly to isolate recognized cases of diphtheria; (c) contact with persons who are in the incubation period of the disease; (d) unrecognized cases of diphtheria with which healthy persons are allowed to come in free contact.

I. *The danger to the individual that he may develop diphtheria.*—Among adults there is a 75 per cent factor of safety to start with, represented by natural immunity. This is further increased by the chance that of the 25 per cent of susceptible adults exposed to diphtheria not all of them will have diphtheria bacilli implanted in throats—a chance, however, that for the sake of safety we will not consider. Of any group of individuals exposed to diphtheria, the susceptible ones may be determined by the Schick reaction. It is obviously unnecessary to give a prophylactic dose of antitoxin to any but the susceptible persons. The time necessary to determine the result of the Schick reaction is 48 hours and during this period all the contacts should be kept in isolation. The incubation period of the disease is given at “from two to five days, most often two,” so that by the time the result of the Schick test is known most of those who are going to develop the disease will already have manifested signs of symptoms. The Schick test has therefore been unnecessary. Antitoxin given in the first 24 hours of the disease is curative in practically 100 per cent of cases. Therefore, if isolation and observation only of the contact is employed without the prophylactic use of antitoxin or the Schick test, the occasional individual who develops the disease under the conditions has lost little if anything, and the large majority of contacts have experienced no inconvenience other than a very short isolation.

II. *Danger to community.*—(a) From carriers: There is no danger from the carrier of nonvirulent bacilli, and the danger from the ordinary healthy carriers of virulent bacilli is so slight that it does not seem practical to take any measures against it.

(b) The necessity of carefully isolating all recognized cases of diphtheria is so universally acknowledged and practically carried out that no further discussion of this point seems necessary.

(c) That persons in the incubation period of the disease constitute a distinct danger is certain, and the prompt isolation of persons who are in contact with diphtheria cases is an important measure. Fortunately the short incubation period of the disease makes necessary only a very brief isolation. If these contacts are isolated and a daily observation made of their throats and symptoms, no other measures are necessary unless suspicious symptoms arise. In such cases cultures should be made and antitoxin given according to the nature of the developments.

(d) Unrecognized cases of diphtheria: It is probable that these cases are the most potent agents in giving rise to the spread of the disease. At a time when diphtheria is prevalent, the most important measure, other than the isolation and treatment of the recognized cases of diphtheria, is the search for the mild cases which might otherwise escape detection. Daily inspection of throats, with an inquiry as to symptoms, will serve to discover all suspicious cases. If these are isolated as they are discovered, a culture taken, and in sufficiently suggestive cases antitoxin given, no serious spread of the disease need be feared. The taking of cultures may be limited in these cases, and to the routine procedure covered by Army orders for the discharge of patients convalescent from diphtheria and to those who have been in attendance on diphtheria.

The Schick reaction may be of value in eliminating 75 per cent of the individuals constituting any group as naturally immune and therefore unnecessary to be kept under observation as possible subjects of diphtheria. It may further be of use in selecting naturally immune persons to serve as attendants on diphtheria patients, and, finally, if active immunization against diphtheria should be undertaken, it will discover those persons who stand in need of immunization.

WALTER D. McCaw,
Colonel, Medical Corps, Chief Surgeon.

Circular No. 61:

AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON, SERVICES OF SUPPLY,
December 18, 1918.

I. The following salient points are noticed in a recent report, based on actual observations, of the nutritional officer, chief surgeon's office:

MESS SERVICE TO PATIENTS

1. Mess lines of soldiers are to be avoided if possible. Two systems of avoiding this are in operation in American Expeditionary Force hospitals:

First. Tickets with different times for presentation at the mess hall are issued to the various groups of men.

Second. Patients are conducted by noncommissioned officers to the mess hall in squads.

In either case the men must be checked to see that their number corresponds with that called for by the diet slips. Patients in pajamas and slippers must not be allowed in lines and exposed to the weather.

DIETITIANS

2. Attention is again directed to Circular 27, office of chief surgeon, c. s., which has evidently not been carefully read. Dietitians are not cooks. Their duties may be defined as follows:

(a) *The dietitian*.—It is her duty to prepare menus for all patients in the hospital. She is to see that the food is properly prepared and served. She should see that the menus are served as written.

(b) She should be present in the kitchens during the preparation of meals. However, during the service she should divide her time between the wards and mess hall in such a way that she may know whether the food is being properly served throughout the hospital. She, or her assistant, is responsible for the issuing of the food to the wards. She should also report to the commanding officer defects of service found in the wards, that these may be corrected through proper channels. Defects of preparation or service found in the mess hall or kitchen should be reported to the mess officer.

(c) She is directly responsible for the preparation of special diets and for special items or modification of the three listed diets. She should, however, be supplied with sufficient help to relieve her from all the details of preparation of these items. It is her duty to advise with the heads of the services, ward surgeons, or nurses, as may be necessary, to insure the patients getting food that is adapted to their needs, while at the same time the kitchen may be relieved of preparing unnecessary specials.

3. In the absence of regularly qualified dietitians, Circular 39, office of chief surgeon, c. s., should prove invaluable, attention particularly being invited to Table II, page 4. Two corrections, as follows, are to be made in Table III: (1) the caloric value of a pint of milk is about 300 calories; (2) one cup of coffee, half milk, contains about 150 calories.

CHIEF MESS OFFICER

4. Large centers should include a chief mess officer as a part of the administrative personnel for the center. Among others, his duties should include the following for the entire center:

(a) Purchaser and distributor of articles of mess.

(b) Inspection of all messes.

(c) Consultant for unit mess officers.

(d) The organization of schools for cooks, bakers, and mess sergeants.

(e) Acting, for a short term, as hospital mess officer in any unit in the center where the regular mess officer is temporarily incapacitated.

Where an officer running one of the hospital messes in a center has acted as purchaser for the center, the results have proven entirely unsatisfactory. One hospital gets fed; the others go without.

II. *Long-distance telephone calls.*—A report from the chief signal officer shows that long-distance telephone calls originated by the Medical Corps were in November, 21.7 per cent more numerous than the average for the previous three months. Attention is called to Circular No. 53, and it is directed that long-distance calls be not made for communications of a trivial nature.

III. *Nurses to pay their own expenses.*—Commanding officers will direct the attention of all nurses to the fact that when passing through Paris under orders they must pay their own expenses and request reimbursement later from the quartermaster and must not call upon the Red Cross for lodging. The Red Cross up to the present time has had arrangements with the Continental Hotel in Paris to take nurses as guests and render the bill to the Red Cross. The Red Cross has notified this office that this arrangement will be discontinued immediately.

IV. *Medical supplies.*—In case of shortages of medical supplies received, General Order No. 57, headquarters Services of Supply, November 21, 1918, will be consulted and the procedure therein outlined followed.

V. *The instrument repair shop.*—The instrument repair shop is now located at Parc des Princes, Porte St. Cloud, Paris.

VI. *Medical Department property of organizations changing station.*—Officers accountable for Medical Department property are directed, upon change of station of their organization, to submit to this office, by letter, a brief report showing the status of their Medical Department property, what disposition has been made thereof, under what authority, etc.

VII. *Salvage medical field supplies.*—Salvage medical field supplies will be shipped to officer in charge, medical supply depot, Montierchaume, Indre, properly invoiced.

VIII. *Disposal of records of hospitals.*—(1) The attention of all hospital commanders is called to Circular 73, War Department, November 18, 1918, which prescribes methods for the disposal of the records of organizations which are being disbanded.

(2) In addition, it is directed that each hospital upon final closing of its work as an organization in the American Expeditionary Forces, shall send its final report of sick and wounded, including (a) final report of sick and wounded for the period since last report, per Section XI, Manual Sick and Wounded Department, A. E. F., dated September 15, 1918; (b) retained file of copies of Forms 22, 647, and 648; (c) retained register index cards Form 52, to the office of the chief surgeon, A. E. F., Tours, in the personal charge of the registrar and such personnel as he may deem necessary in addition. After examination of these records and the making of the necessary corrections in them the registrar will be given a clearance receipt.

(3) In the case of medical units (infirmaries, etc.) other than hospitals, which function as hospitals and are required to render sick and wounded reports, the final report and records may be forwarded in charge of a responsible soldier, preferably one who has had to do with the preparation of the records and reports.

(4) Such records as are to be sent to Washington in accordance with Circular 73 may be sent by postal express. Such records, relating to Medical Department work or personnel, as Circular 73 designates to be left at camp headquarters should instead be sent to the office of the chief surgeon, to be kept until checked against by Washington.

(5) The supply of Circular 73 is limited, but as soon as sufficient quantities are received they will be distributed.

IX. *Property.*—Medical officers accountable for property, when returning to the United States, should report their departure by letter to this office (finance and accounting division). Statement of property charged against them will be forwarded to the office of the surgeon general for settlement. In case transfer of property is made to another accountable officer in the same unit, clearance of departing officer's accountability will be expedited if the officer before his departure submits a final return to this office (finance and accounting division). If a unit is disbanded and property turned into salvage or supply depots, transfer should be made in the usual manner. When vouchers covering above are forwarded to this office, certificate that all property has been disposed of should accompany the last voucher. In this case also clearance of departing officer's accountability will be expedited if he submits before his departure final return to this office (finance and accounting division). Medical Department officers responsible for but not accountable for property should clear their responsibility to accountable officer before their departure.

X. *Lice*.—A recent inspection of patients received from base hospitals at classification camps shows that 12 per cent are infested with lice. This appears due to the fact that pubic and axillary hairs are not carefully inspected for presence of nits.

In future, in addition to usual manner of disinfestation, the pubic and axillary hairs will be clipped.

XI. *Advance medical supply depot No. 2*.—Advance medical supply depot No. 2 has been established by the Services of Supply at Treves, Germany, to furnish medical supplies to armies and all other medical units in Germany.

WALTER D. McCaw,
Colonel, Medical Corps, Chief Surgeon.

Circular No. 62.

AMERICAN EXPEDITIONARY FORCES,
CHIEF SURGEON'S OFFICE, SERVICES OF SUPPLY,
December 23, 1918.

EPIDEMIC CEREBRO-SPINAL MENINGITIS (CEREBRO-SPINAL FEVER)

The following bulletin is published to amplify and modify the instructions relative to the handling of epidemic cerebro-spinal meningitis heretofore issued from this office, more particularly those incorporated in the bulletin on transmissible diseases and the use of therapeutic sera.

Clinical manifestations.—The early signs and symptoms of cerebro-spinal fever are those common to many other acute infections. Headache is almost always present. Vomiting is often an early manifestation. Fever is almost invariably present. Constipation is a fairly constant symptom. The pulse is relatively slow in relation to the temperature. Changed mental activity, varying from a slightly increased delay in cerebration, marked apathy, drowsiness to restlessness or even violent delirium, is generally present. A petechial rash about the shoulders, arms, and pelvis occurs in about a fifth of the cases. When such manifestations as these are present, cerebro-spinal fever should be considered in the differential diagnosis, and, in case of doubt, a blood culture should be taken and the advisability of spinal puncture weighed.

More characteristic manifestations include stiffness of the neck, tending to increase upon continued movement of the examination, retraction of the head, sluggishness and inequality of the pupils, stiffening of the hamstring muscles (Kernig's sign), incontinence or retention of urine, and sudden deafness, total or partial. Such manifestations, unless adequately explained as due to a cause other than meningitis, are imperative indications for spinal puncture.

Specific diagnosis.—Diagnosis depends upon the recognition of the meningococcus in the fluids derived from the patient. Meningitis, with all its clinical manifestations, may be caused by any one of several other organisms without the meningococcus being present. Such forms of meningitis do not possess the epidemic tendencies of the meningococcus meningitis, a fact which renders their bacteriological differentiation very important.

For diagnostic purposes the meningococcus is sought in the nasopharynx, in the circulating blood, and in the cerebro-spinal fluid. In specimens from the nasopharynx many other bacteria are likely to be met with. In the circulating blood and in the spinal fluid the bacteriology is ordinarily simple.

Cerebrospinal fluid is obtained by lumbar puncture in the median line between the fourth and fifth lumbar vertebrae. This point is on a line joining the summits of the iliac crests. The fluid should be collected in a series of sterile tubes. The normal fluid is water clear and contains less than 10 leukocytes per cubic millimeter. In meningitis the fluid is usually, but not always, under increased pressure and more or less turbid, and the number of leukocytes is greatly increased. Cultures should be made at once by spreading a drop of the fluid over the surface of a suitable medium in a Petri dish. Gordon's trypsin agar* to which has

* Gordon's trypsin agar may be obtained from the central Medical Department laboratory or from the nearest base laboratory.

been added ether-laked blood is recommended, but glucose agar mixed with blood or with laked blood may be used. A portion of the fluid should be mixed with an equal volume of plain broth and incubated, and a portion should be incubated without the addition of any other medium. All media should be incubated before use, should be warm when inoculated, and kept at 37° thereafter. The sediment should be smeared on slides, stained with Wright's or Leishman's stain, and examined with the oil immersion objective, observing the numerical relations of red blood cells, various types of white cells, morphology and position of the bacteria present. A second smear should be stained by Gram's method. The presence of Gram-negative intracellular diplococci in the spinal fluid warrants a provisional diagnosis of meningococcus meningitis. Identification of the organism in cultures will be considered subsequently.

If clinical diagnosis of cerebrospinal fever has been made, a dose of polyvalent anti-meningococcus serum should be given at once through the same needle that is used for obtaining the specimen of spinal fluid, without waiting for the bacteriological report. The prompt introduction of this first dose of serum is of utmost importance to the patient. It is best run in by gravity, very slowly, 2 c. c. per minute, the total dose being 15 to 40 c. c., or two-thirds of the volume of fluid removed.

Blood culture may give positive results in cerebrospinal fever before clinical manifestations of meningitis are evident, especially in fulminant cases. At least three agar plates and two broth cultures should be made with a total quantity of 10 c. c. of blood. Gram-negative diplococci appearing in pure culture in these media warrant a tentative diagnosis of cerebrospinal fever. The final identification of the organism will be subsequently considered.

Cultures from the naso-pharynx give positive results in the large majority of cases of cerebrospinal fever but, on account of the admixture of other micro-organisms in the specimen, material from this region is less suited for rapid diagnosis of the active case of meningitis than is the cerebrospinal fluid. However, many individuals are infected with meningococcus in the upper respiratory passages without the infection extending to the blood stream or to the meninges. Such individuals may show no clinical evidence of the infection. Their detection, segregation, and treatment constitutes an important part of the procedure for restricting the spread of cerebrospinal fever. As a general rule the examination of the naso-pharynx for meningococci should be resorted to only in active or convalescent patients and in persons who have been very closely associated with such patients. General surveys of entire regiments or brigades by this method in a search for carriers are, as a rule, unwarranted.

The specimen should be obtained from the mucous membrane of the naso-pharynx without contamination from the mouth or palate, because the presence of saliva and of the normal buccal or pharyngeal bacteria interferes with the subsequent detection of meningococci in the specimen. A considerable degree of technical skill is essential in getting the specimen. In some cases a protected swab (West swab) will be of service. The material from the naso-pharynx should be placed at once on the surface of hæmoglobin agar plates and kept warm. It may be spread at once or after a brief interval, if more convenient. The medium is prepared by mixing ether-laked blood with Gordon's trypsin agar. Rabbit's blood or human blood (10 c. c.) may be used, laked by the addition of ether (5 c. c.) and distilled water (90) and added (1:50) to the melted agar, previously cooled to 45° C. The mixed medium is then poured into Petri dishes, allowed to harden, and warmed to 37° before use. After inoculation the plates are kept warm until transferred to the incubator at 37° C.

Identification of the meningococcus.—Gram-negative diplococci found in cultures from the cerebro-spinal fluid or from the circulating blood should be subcultured to trypsin agar without blood enrichment, for testing against specific agglutinating sera. Colonies of Gram-negative diplococci found on the plates inoculated with pharyngeal mucus require more critical scrutiny because other Gram-negative cocci are frequently met with on such plates. The colonies should be examined after 16 to 24 hours incubation, first with the naked eye and then with a lens magnifying about 10 diameters. The meningococcus colony presents a glistening appearance and has a bluish-gray tint by reflected light (black background). It is transparent, colorless, or very slightly yellow, by transmitted light. Its margin is

smooth and circular. The lenticular character of the colony allows an inverted image of window bars or other objects to be seen by looking through it. The colony less than 24 hours old shows no internal markings.

Suspicious colonies, whether derived from cerebrospinal fluid, circulating blood, or pharyngeal mucous membrane, should be transplanted to trypsin agar without hæmoglobin enrichment. On the next day these cultures are examined by Gram's stain and then subjected to agglutination with specific serum. For this purpose the growth is suspended in salt solution, thoroughly shaken, and heated in a water bath at 65° C. for 30 minutes to kill the bacteria and destroy the autolysin. To prepare the suspension of suitable concentration for the tests, one measures out 0.1 c. c. into a clear test tube 12 mm. in diameter. A measured amount of salt solution or of clear water is then run in from a burette or graduated pipette until the diluted suspension is just perceptibly turbid, read by daylight, in comparison with a control tube of the diluent. This end-point concentration is assumed to represent approximately 100,000,000 cocci per cubic centimeter. One then calculates the approximate concentration of the original suspension and the volume to which it must be diluted in order to obtain a suspension of approximately 2,000,000,000 cocci per cubic centimeter. Salt solution, together with sufficient 5 per cent carbolic acid to furnish 0.5 per cent of this preservative in the final volume, is then added up to this volume and the whole thoroughly mixed. Such a suspension, heated, diluted, and phenolated, may be kept for several months.

For the agglutination test the specific sera to be employed are prepared in 1 to 100 dilutions and at the same time normal control sera of horse in 1 to 25 and 1 to 50 and of rabbit in 1 to 25 dilution. Equal volumes of the bacterial suspension and of the dilute serum are mixed in each instance in a series of tubes so that the final serum dilutions are 1 to 200 for the immune sera and 1 to 50 and 1 to 100 for the control normal horse serum and 1 to 50 for the normal rabbit control. All the tubes are plugged with cotton or corks and immersed in a water bath at 55° C. for 16 hours. Under these conditions a true meningococcus should not be agglutinated in the normal control sera, but should be completely agglutinated by one of the specific type sera and by the polyvalent immune serum. Micrococcus flavus will be agglutinated in the normal control as well as the others. For critical investigations it is well to employ agglutinating sera of each type in graded dilutions as well as polyvalent serum, and to control the activity of each diluted serum by running it against a known standard-type suspension at the same time that the unknown cocci are being tested. When a large number of cultures have to be tested under field conditions one will often employ only polyvalent diagnostic serum and the normal serum control.

The supply of meningococcus type sera available in the American Expeditionary Forces is somewhat uncertain. Three sources of supply are being utilized and the sera supplied may be from any one of these. They are designated as follows:

I	II	III
Rockefeller Institute meningococcus diagnostic type sera	Pasteur Institute meningococcus diagnostic type sera	Gordon meningococcus diagnostic type sera
Normal meningococcus. Intermediate A. Intermediate B. Parameningococcus. Polyvalent.	Type A. Type B. Type C. Type D. Normal horse serum control.	Type I. Type II. Type III. Type IV. Normal rabbit serum control.

The mutual relationships of the recognized types in these different classifications are still somewhat uncertain.

Serum treatment.—Aseptic technic is essential. The serum should have a temperature of about 40° C. when injected. At the first spinal puncture, when indicated, polyvalent antimeningococcus serum should be injected at a rate not to exceed 2 c. c. per minute. The amount introduced should be about two-thirds of the volume of spinal fluid withdrawn. Following the injection, the patient should lie with his head somewhat below the level of the buttocks to favor the diffusion of the heavier serum to the head. Immediately afterward, especially in severe cases, 50 to 100 c. c. of the serum should be very slowly introduced

intravenously, not faster than 1 c. c. per minute for the first 10 minutes, but at a gradually increasing rate after that if no untoward symptoms appear.

In severe cases the spinal puncture should be repeated twice at intervals of 8 to 12 hours, giving a further intraspinal injection of serum each time. After that the interval may be lengthened to 24 hours. Even in patients who show most marked improvement after the first injection, a second puncture after 24 hours, with injection of serum, should always be performed. The character of the spinal fluid withdrawn, in conjunction with the clinical signs, is a guide for continuing or stopping the intraspinal treatment. Repetition of intravenous injection is usually necessary also.

Anaphylaxis.—Serious intoxication from injection of horse serum is not likely to occur after intraspinal injection. It may occur when intravenous injection is done and, for this reason, the first part of the serum should always be introduced very slowly and the injection interrupted at the first sign of distress. Hypersensitiveness to horse serum is often present in persons who have previously been injected with serum, but it exists also in other persons.

To avoid the dangers of hypersensitiveness, 1 c. c. of the serum may be injected subcutaneously, followed after an hour by the slow intravenous injection of the full dose. Where time permits, one may first give a subcutaneous injection of 0.5 c. c. of serum diluted with 0.5 c. c. of salt solution, followed after 5 minutes by a second subcutaneous dose of 1 c. c. of serum, and 15 minutes later by a third subcutaneous dose of 5 c. c. of serum. One hour later the intravenous injection of the full dose should be begun. Injections should always be made slowly, with careful attention to the patient's condition, and the serum should be warm when injected.

Fear of anaphylaxis should never prevent the use of serum when indicated. Careful technic and slow administration will go far to avoid serious accidents of this nature.

Contacts.—Military experience has shown that a single case of cerebrospinal fever, isolated and properly cared for as soon as the disease is recognized, is ordinarily not followed by subsequent cases in his immediate associates. Those who have been immediately associated with the patient, especially at mess and in sleeping quarters, should be segregated in roomy, light, and clean quarters and eat at a separate mess for a period of two weeks, at the end of which period they may be returned to their proper organization, in the event that no other cases have developed. When, however, more than one case has appeared in a given small group of men, the immediate associates require not only segregation but also bacteriological examination and treatment.

The amount of time devoted to the examination of contacts will have to depend upon the circumstances, such as the extent and character of the epidemic, the number of contacts to be handled, and the amount of trained help available for the purpose. It is not well to make a pretense of elaborate surveys of contacts when the danger is not considered sufficient to warrant employing the necessary personnel actually to do the work in an efficient manner.

According to available facilities, the pharyngeal culture may be taken only once, or a duplicate set may be made on the following day. In any case the men should be segregated before the examinations are begun, and when possible those with coughs and colds should be segregated apart from the others. Separate, clean, airy, and light quarters under strict quarantine should be provided for them. Their treatment as carriers should begin directly after the desired number of specimens has been obtained for bacteriological examination. In addition to general hygienic measures such as cleanliness, good food, properly regulated work, play, and rest, the local antiseptic treatment of the upper respiratory passages may with advantage be tried. Various medicaments may be used. Dichloramine-T in chloroform, administered by atomizer, is a convenient agent with which to begin. This antiseptic treatment may prevent to some extent the spread of the infection to previously uninfected men who may be in company with actual carriers while awaiting the result of the laboratory examination.

As soon as a negative result has been reached in these first laboratory examinations, the particular man may be released to his organization. In this way the number of men held in segregation can be very much reduced within two days. Suspicious or positive laboratory results warrant retaining the respective individuals in segregation for further observation.

After six days the antiseptic treatment of the positive cases should be discontinued for 24 hours before new cultures are taken, after which the treatment may again be continued. At the end of another week the treatment should be stopped for 24 hours before the third bacteriological examination. The treatment may then again be continued until the laboratory reports have been received. All men found negative at these two examinations should be returned to their organizations. The remaining men should be transferred to a segregation barracks or available hospital formation for treatment as chronic carriers.

General hygienic measures.—In any command in which an outbreak of cerebrospinal fever has developed, general measures should be instituted at once to improve the living conditions and prevent the spread of respiratory infections among the men. Overcrowding in billets and barracks should be relieved by placing part of the men in tents. Those with coughs and colds should be quartered apart from the others. Distance between heads of adjacent sleepers should be increased by head to foot arrangement of bunks, or the bunks should be separated by wooden partitions or by shelter halves so hung as to separate the sleepers.

Sleeping quarters should be fully ventilated day and night, and blankets, mattresses, and clothing should be aired and exposed to sunlight daily, weather permitting.

A special place for drying clothing should be provided, and clothing, wet or dry, should not be allowed at the head of the bunk.

Dust in quarters should be avoided by cleanliness and by dampening dirt floors with a disinfecting solution.

All personal equipment—mess kits, pipes, clothing, towels, toilet articles—must be used only by a single individual, and all mess equipment washed and rinsed in boiling water after use.

The entire command should be examined daily, preferably in the afternoon, to detect beginning illness. Lounging in quarters during the day should be avoided, and sick should be hospitalized at once. Pillows should be prohibited unless they have been properly disinfected before being issued to new troops.

Careless coughing and sneezing should be prohibited and promiscuous spitting promptly and severely penalized. Gauze masks, not less than eight thicknesses, or the combat gas masks, may be worn during cleaning operations involving exposure to dust. The former should be immersed in boiling water after use.

WALTER D. McCaw,
Colonel, Medical Corps, Chief Surgeon.

Circular No. 63.

AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON, SERVICES OF SUPPLY,
December 30, 1918.

I. Roentgenograms.—Directions for selection and shipping of Roentgenograms for the Army Medical Museum, Washington, D. C.:

The commanding officer of each base or camp hospital in the American Expeditionary Forces will have all Roentgenograms on file in his hospital examined by the hospital Roentgenologist with a view to selecting those suitable for preservation in the Army Medical Museum. In hospital centers or groups the work should be done under the direction of the consulting Roentgenologist for the group.

The following directions will be observed:

1. Discard all technically imperfect plates unless of unusual interest.
2. Discard all normal or negative plates.
3. In selecting plates, emphasis should not be placed upon the bizarre or unusual. It should be kept in mind that this collection of Roentgenograms is to be used especially for teaching purposes.
4. Gastro-intestinal and genito-urinary plates are not desired unless related to war trauma.

5. Plates especially desired are those of good technical quality illustrating all war wounds and diseases of the chest.

6. Each plate or film should be plainly marked with the date, patient's name, number, and organization.

7. Each plate or film will be accompanied by the clinical history; autopsy records, if any; personal observations by the Roentgenologist; and all other data throwing light on the case.

8. Plates should be packed with great care, having in mind the special liability to breakage in overseas shipment. The plates should be placed face to face in pasteboard boxes and then in wooden cases well protected with excelsior, paper, or straw. Each box will be marked in both French and English to denote the fragile nature of its contents.

9. Films should be packed in tin cases and sealed.

10. Each box should be numbered and addressed to the Army Medical Museum, Washington, D. C., via ----- (port).

11. When shipment is made, Col. Joseph E. Siler, central laboratory, Dijon, will be notified of the fact giving the number of the French ordre de transport, number of car in which shipped, and the name of the port to which shipped.

12. The senior consultant in Roentgenology will be notified by letter when shipment is made, giving the number of plates and films shipped, the ordre de transport number, and number of the car.

13. Any additional advice needed may be obtained by letter to the senior consultant in Roentgenology, headquarters medical and surgical consultants, A. P. O. 731.

II. *Epidemic disease.*—Pursuant to request of the French Service de Sante, the chief surgeon directs that the surgeons of all organizations and commanding officers of medical units promptly notify the local French military and civil authorities upon the appearance in their organization of any epidemic disease.

Attention is called to the general neglect by medical officers, particularly those of hospital formations, base, camp, and field, of the requirement that they shall notify the local French military and civil authorities (the médecin chief de place and the maire or prefet) of all cases of communicable diseases as soon as diagnosed or admitted to their organization. The letter from the chief surgeon, line of communications, of January 28, 1918, is quoted, and compliance will be expected.

It is of considerable importance that every case of any of the diseases specified in Section XII, Sick and Wounded Reports, be reported to the French authorities at the same time that it is reported to the chief surgeon, A. E. F.

III. *Vacancies in permanent Medical Corps.*—The Surgeon General writes as follows to the chief surgeon, A. E. F.:

There is, at present, a large number of vacancies in the permanent Medical Corps of the Army, and it is desired to take advantage of the present conditions to fill them with desirable men—preferably with those who have had some military service in the present war.

It is therefore requested that you give careful consideration to the selection of suitable officers and that you make a special effort to interest medical officers who have demonstrated their ability and fitness.

The attention of all medical officers who may be considering entry into the regular corps is called to the fact that rank therein dates from entry, and, if they should decide that they wish to remain in the Army permanently, each week of delay may mean loss of rank which would affect them during their entire service.

IV. *Commutation value of the ration.*—This office has been advised by the chief quartermaster that the commutation value of the ration has been fixed at \$0.58 for the months of January, February, and March, 1919. Amounts collected by hospitals from local quartermasters should therefore be \$0.68 or \$0.83, according to whether or not commissary privileges are available.

V. *Clothing for army nurses.*—The chief quartermaster advises that he has now in stock hats, overcoats, Norfolk suits, gray ward uniforms, raincoats, shoes, rubbers, silk and cotton waists, and that those articles of clothing are for free issue to all Army nurses whose pay does not exceed \$75 per month. Commanding officers of base hospitals and hospital cen-

ters will consolidate the requisitions submitted by the various members of their unit, and submit same direct to the office of the chief quartermaster, care being taken to furnish exact sizes of shoes and other garments desired.

Requisitions will be restricted to actual requirements only. All requisitions must be approved by chief nurses, who will assure themselves of the actual need of articles requested.

Sales to nurses whose pay exceeds \$75 per month will be made at cost prices as follows:

Shoes.....	\$6. 31	Raincoats.....	\$5. 60
Silk waists.....	5. 22	Hats.....	3. 17
Overcoats.....	27. 86	Uniforms, gray, ward.....	3. 00
Norfolk suits.....	30. 00	Waists, cotton.....	. 73

VI. Paragraph 229, Manual for the Medical Department, 1916, is changed, as follows:

229. Upon the discharge from the hospital of patients permanently disabled, they may retain the appliances then in their use which are necessary for their comfort and safety; and the accountable officer will drop the same from his next return of medical property, submitting a certificate explaining the circumstances as a voucher for so doing, to which will be appended the patient's receipt for the appliance.

VII. *General office supplies.*—Attention is invited to General Order 50, headquarters, Services of Supply, transferring the procurement and distribution of standard office supplies, heretofore issued by the Medical Department, to the chief quartermaster. The following items are excepted from the provisions of this order, and will be required for as heretofore by Medical Department units:

- Books, prescription, paragraph 240.
- Binders, loose-leaf, for medical history of post.
- Files, Shannon, for clinical history.
- Labels, for dispensary sets.
- Labels, for vials.
- Labels, poison, assorted.
- Pads, prescription.

Requisition for office supplies (stationery, office furniture, etc.) will in the future be made on the Quartermaster Department by all Medical Department units.

VIII. *Baggage of patients.*—Commanding officers of all base, camp, and evacuation hospitals will notify the central baggage office, A. P. O. 713, Gievres, of the respective departure for the United States of sick and wounded, under their care, and of the location of their baggage, as well as a list of all patients who have already been evacuated. This information will greatly assist the baggage service in getting baggage to its owner before the owner departs for the United States.

IX. *Publications.*—The War Department desires complete files of all publications made by different organizations in the American Expeditionary Forces.

Complete files, whenever possible, will be forwarded to J. Terquom, Paris agent for the Library of Congress, No. 19 Rue Scribe, Paris. This office will be notified whenever files of a publication are forwarded to Paris.

X. *Proper papers to accompany men evacuated from base hospitals.*—Reports are being received that base hospitals are careless in forwarding men to base ports for evacuation to the United States without proper papers. The greatest care must be exercised by all base hospitals evacuating patients to base ports to see that all papers are complete, with proper number of copies of each paper, especially those relating to disability boards and orders directing travel. These points have been covered many times, and it appears that they are not being followed in a conscientious and painstaking manner.

XI. *Broken splints.*—Instructions previously issued, directing the shipment to splint repair shop, Dijon, of broken splints, are hereby revoked. In view of the fact that this shop has been discontinued, these splints will in the future be turned in to the nearest medical supply issue depot.

WALTER D. McCaw,
Colonel, Medical Corps, Chief Surgeon.

Circular No. 64:

AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON, SERVICES OF SUPPLY,
January 7, 1918.

I. Hospital fund.—(1) Organizations returning to the United States: All medical organizations in the American Expeditionary Forces which are under order to return, or which in the future receive orders to return, to the United States as a unit shall, as long before their departure as is practicable, close out their accounts, and send in a complete report to this office (finance and accounting division) of the condition of the hospital fund, giving in detail any accounts which remain unpaid or amounts due to the fund which remain uncollected, together with the number of enlisted personnel in the unit. Instructions will be issued by this office as to what portion of the fund may be retained by the organization. The balance, if any, will be forwarded to this office, to be credited to the United States Army hospital fund; checks or negotiable papers being made payable to "trustee, United States Army hospital fund." The final account will be audited by the hospital council, and the proceedings shown in the face of the statement.

(2) Organizations disbanding: Any organization which disbands or for any other reason ceases to exist as a unit will submit, after audit by the hospital council, a final statement on Form 49, M. D., showing the proceedings of the council, properly signed on the face of the statement, and turn in all funds to this office to be credited to the United States Army hospital fund; checks or negotiable papers being made payable to "trustee, United States Army hospital fund." Upon receipt and acceptance of the final statement the custodian will be cleared of all accountability for the funds of his organization.

(3) Transfer of funds: No organization under orders to disband or return to the United States shall transfer funds to any organization without authority from this office.

(4) Disposal of funds: Custodians of funds will be held responsible for the improper disbursement of the funds for purchases of articles which are not proper expenditures from the hospital fund.

(5) Transfer of fund: Any officer who is custodian of a fund and who is transferred from his organization, or for any other reason is to be absent for a period of more than 10 days, will submit a final statement on Form 49, M. D., showing the following properly signed certificates:

I certify that to the best of my knowledge the following is a complete and accurate statement of all outstanding debts and obligations payable from this fund, and to have transferred to my successor-----, the sum of -----, being the balance on hand this date of the hospital fund of -----.

I certify to have received the sum of -----, from -----, being the balance on hand this date of hospital fund of -----.

Until the final statement bearing the above properly signed certificates is received, the present custodian will be held responsible for the funds of his organization.

II. Purchase of medical supplies.—All purchases of medical supplies in Paris will be made through the office of the medical purchases, room 507, Elysee Palace Hotel, in that city, when same are properly authorized.

The practice of obtaining medical supplies from the French Government through local Service de Sante formations, and having same vouchered to the Medical Supply Department, United States Army, payment to be made on consolidated bill by a medical disbursing officer, will be discontinued at once.

Authority for purchases must be obtained before purchase is made from the chief surgeon, A. E. F., except on purchases covered by Circular 15, paragraph 4, office of the chief surgeon, dated December 15, 1917, which applies to detached base hospitals, and Circular 43, paragraph 9, dated August 1, 1918.

Hereafter a copy of the authority for purchase will accompany the voucher; this in addition to the usual notation of authority on the face of the voucher. Copy of Form No. 12 accompanying the voucher will have entered thereon the property voucher number of the accountable officer.

III. History and clinical records.—Reports have been received in this office that proper histories and clinical records, including laboratory and X-ray blanks, are not being

forwarded with patients evacuated to the United States. Such history and clinical record as may be necessary for the proper care and understanding of the case must accompany each patient upon his evacuation.

IV. *Operations.*—It has been evident for some time that a large number of operations are being performed that are not absolutely necessary. In this connection attention is called to Circular 37, office of chief surgeon, June 22, 1918, with special reference to paragraph 4 thereof.

V. *Leather jerkins available for issue to Army nurses.*—Leather jerkins are now available for issue to Army nurses. Requisition therefor should be made upon the local quartermaster, approved by the chief nurse of the unit, stating that the nature of the nurse's duty requires the jerkin.

VI. *Returning class A patients to duty.*—In returning class A patients to duty with organizations, men must be equipped with the following: 2 blankets, 1 overcoat, 1 blouse, 1 pair breeches, 1 suit of underwear, 2 pairs socks, 1 pair shoes, 1 overseas cap, 1 mess kit, toilet articles. Requisitions will be made immediately on the Quartermaster Department and Ordnance Department to carry these instructions into effect.

Before returning men direct to organizations, the organization commander will be telegraphed as to ability to receive them.

VII. *Y. M. C. A. patients in military hospitals.*—Y. M. C. A. secretaries and workers who are patients in military hospitals for wounds or any other cause will, when able to travel, be sent to the Paris headquarters of the Y. M. C. A., where adequate arrangements are made for their future care and transportation.

VIII. *Vaccination against typhoid and paratyphoid fevers.*—Typhoid fever has been recognized in several different organizations in the American Expeditionary Forces, especially those recently engaged in active military operations. Medical officers should be on the alert to detect this disease early in its course. Typhoid and paratyphoid fever should be considered in the differential diagnosis of all obscure pyrexias. Early blood culture is advised.

Triple typhoid lipo-vaccine is available for immunization of the men of those organizations in which outbreaks of these fevers have appeared. Whenever as many as two cases occur in the same company, within a period of one month, the vaccination of the entire company is advised. If scattered cases amounting to one-half of 1 per cent of the strength of the organization occur in a battalion or a regiment, within a period of one month, immediate inoculation of the entire organization with lipo-vaccine should be undertaken. Only one dose of this vaccine is required. It must be injected into the subcutaneous areolar tissue. The precautions and contraindications are the same as for the saline vaccine previously employed. In this connection your attention is invited to Circular 59, this office.

IX. *Lice.*—Reports still continue that patients are evacuated from base hospitals who are lousy. This reflects not only upon the cleanliness of the hospital but the care and administration as well. Commanding officers will take proper steps to see that every patient is carefully examined and when found infested with lice will have effective treatment for their eradication.

X. *Convalescent home for nurses at Antibes, near Cannes.*—The American Red Cross has opened another convalescent home for nurses at Antibes, near Cannes. Eighty nurses can be cared for after January 6 and a maximum of 200 about January 15. All convalescent nurses should go to Antibes, and arrangements should be made before they leave their stations to secure reservations at Paris. Many convalescent nurses are reported to have arrived at Cannes physically exhausted on account of difficulty in securing accommodations on board the train.

Commanding officers of Medical Department formations will in the future forward to this office a carbon copy of their daily reports on Forms Nos. 647 and 648, A. G. O.

XI. *Neuropsychiatrists.*—The senior consultant in neuropsychiatry recommends, and this office approves, the retention of neuropsychiatrists in tactical divisions. In at least one case, the division neuropsychiatrist has been relieved from duty with the division because no allowance was made for his assignment to the division by tables of organization. This difficulty could easily be obviated by assigning him to the Sanitary Train.

XII. *Quartermaster personnel.*—Upon the abandonment of hospitalization from various places, commanding officers concerned are instructed that all Quartermaster Corps personnel, not pertaining to statutory units, as they become surplus will be sent to the Quartermaster casual depot, Camp Clayton, Chateau-du Loir (Sarthe), and the chief quartermaster notified of action taken.

WALTER D. McCaw,
Colonel, Medical Corps, Chief Surgeon.

Circular No. 65.

AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON, SERVICES OF SUPPLY,
January 15, 1919.

I. *Monthly reports, sick and wounded.*—The following circular letter, Surgeon General's office, November 14, 1918, is quoted for the information of all:

1. All responsible medical officers are urgently requested to prepare and forward as soon as practicable after the close of the calendar year all the monthly reports of sick and wounded for the year.

2. It is recognized that in large hospitals, and particularly during extensive epidemics, that it is impossible to prepare and forward the report within five days as required by the N. M. D. Certainly, however, it should be possible to prepare and forward the reports some time during the succeeding months. In many instances reports are several months delinquent. Requests for information are being constantly received from other Government agencies for information which it is difficult or impossible to furnish for this reason. It was impossible to begin the final tabulation of the statistics for the year 1917 until the 1st of May of the year 1918 because so many reports were delinquent. Even after the 1st of May, 1918, a good many reports for the year 1917 were received.

3. Reports for the year 1918 must be forwarded to this office not later than January 31, 1919.

II. *Salvage of supplies belonging to the British and French medical services.*—(1) All supplies received in salvage belonging to the British medical supply service should be shipped to ordnance officer, Graville, Le Havre.

(2) All medical supplies received in salvage belonging to the Service de Sante medical service should be disposed of as follows: A list covering the property in question in each "region" should be sent to the "directeur du Service de Sante" of the region concerned, who will issue instructions covering its disposition.

III. *Registrars.*—The attention of all registrars is called to typographical error in Manual of Sick and Wounded Reports for the American Expeditionary Forces. In Section XI, paragraph 1, line 6, the parentheses should read "(Sec. Sec. VI, par. 7, and Sec. VIII)."

In the monthly sick and wounded report the cases transferred to the United States differ in no way from cases completed in other manner except that the field medical envelopes and contents accompany the patient instead of being forwarded as a part of the report.

IV. *Gas for anæsthesia.*—Hereafter nitrous oxide gas and oxygen will be furnished by medical supply depots only. Empty nitrous oxide tanks will be shipped to American Red Cross nitrous oxide plant, Montereau (Seine-et-Marne), and empty oxygen tanks to the nearest medical supply depot.

V. *Nurses.*—(1) Incidents have occurred where Army nurses traveling under orders changing station, and nurses suffering from physical disability traveling between hospitals or to base ports for return to the United States, have encountered great difficulties and discomforts at railroad stations, in boarding trains, in securing seats, in changing cars, and at places of arrival, and have occasionally had to spend the night in railroad stations.

(2) Hereafter it will be the duty of commanding officers of hospitals or other units forwarding nurses to see that seats are obtained and that nurses and their baggage are put aboard trains, and, after a study of the time-tables and changes, to telegraph the commanding officer of any hospital at places where changes of trains are made, or at places of destination, or to surgeons of base sections in the case of nurses arriving at base ports, giving the number of nurses, the time of arrival, and destination.

(3) It will be the duty of any medical officer receiving this message to have some one meet the train, arrange for transportation, assistance with baggage, place to remain at hospitals or other suitable quarters overnight when necessary, to notify the medical officer at the next place where assistance is desired, and to give any help that may be required.

VI. *General Order No. 1, c. s., headquarters, Services of Supply.*—The attention of all commanding officers of Medical Department units is invited to General Order No. 1, c. s., headquarters, Services of Supply.

VII. *Special articles of clothing not issued generally.*—The commanding general, Services of Supply, directs that commanding officers of all hospitals handle special articles of clothing not issued generally to all enlisted men in such a manner that they will be returned to their original owners in a serviceable condition upon their discharge from the hospital.

VIII. *Neuropsychiatric patients.*—In the future no neuropsychiatric patients will be transferred to Base Hospital No. 117, La Fauche (Haute Marne). This hospital is in the process of being closed and abandoned.

IX. *Improper classification of patients in hospital.*—Many reports, general and specific, are being received regarding improper classification of patients in hospital. Men have been returned to duty as class A before their wounds were properly healed and when dressings have been necessary. It is imperative that greater care and attention be given to the proper classification of patients in hospital. Commanding officers will, either personally or by delegation of a thoroughly reliable medical officer, supervise this work. The reports received reflect seriously upon the care and attention given by classification boards to the patients in hospital.

X. *Baggage department.*—Regarding the establishment of a baggage department and the handling of baggage of patients in hospital, attention of commanding officers of all hospitals is invited to Bulletin 48, headquarters, Services of Supply, December 3, 1918, and General Orders, No. 62, December 5, 1918, headquarters, Services of Supply.

XI. *Typhoid fever and paratyphoid fever.*—All medical officers, and especially those in charge of hospitals, and particularly those on duty in medical wards of hospitals, are advised to note carefully and follow precisely the precautions with regard to the handling, diagnosis, and release after convalescence of cases of suspected or diagnosed typhoid and paratyphoid fevers, as given in sections 184 and 185, of Article III, of the Manual of the Medical Department:

184. Early detection of all cases of typhoid fever is necessary, especially those of mild or ambulant type, and of all typhoid carriers or excretors. Undetermined fevers should be regarded with suspicion and handled like typhoid until that disease is excluded. Specimens of blood from suspected cases should be sent promptly to the nearest laboratory for diagnosis.

185. No patient convalescent from typhoid should be released from isolation until three successive examinations of his stools and urine, collected at six-day intervals, have shown him to be free from typhoid bacilli.

XII. *Commanding officers of hospitals to notify commanding officers of organizations.*—In view of the present prevalence of typhoid fever in the American Expeditionary Forces, it is directed that commanding officers of hospitals notify by telegraph the commanding officers of organizations from which the patient has been admitted, as soon as a case of typhoid or paratyphoid fever has been suspected or diagnosed. This report will be sent at the same time as, and in addition to, the telegraphic report sent to the office of the chief surgeon, in compliance with Section XII of the Sick and Wounded Reports.

XIII. *Professional reports.*—The office of the director in charge of professional services has been closed in our reports. All professional reports required by consultants should be forwarded direct to the office of the chief surgeon.

XIV. *Class A men.*—Surgeons of the base ports who are charged with the evacuation of patients report that there are an increasing number of class A men, or men to become class A shortly after their arrival in port hospitals, being evacuated to base ports with the idea of their being sent to the United States. This is contrary to all instructions. Commanding officers and evacuating officers will give special attention to this and see that none of this type of patients are sent to the ports.

WALTER D. McCaw,
Colonel, Medical Corps, Chief Surgeon.

Circular No. 66:

AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON, SERVICES OF SUPPLY,
February 4, 1919.

I. Cafeteria system of messing patients.—(1) During the crisis when personnel and equipment were being worked to the utmost limit, the line, or cafeteria, system of feeding patients was in many cases the only practicable one.

(2) Now that the number of patients is reduced to the normal capacity of the units it is desired that the table service be substituted for patients as rapidly as possible.

(3) Inspectors have reported on the presence of patients in pajamas and gowns standing in line in inclement weather. This should under no circumstances be allowed to occur, and the substitution of table service for line will prevent this most undesirable condition.

(4) It is not expected that the table service can be used in all cases for large personnel and casuals on duty status, as in these cases the line system is perhaps the only feasible one. It is, however, desired that patients will not be messed in the line system.

II. Sales of excess medical property.—Sales to private individuals or associations can only be made through the French Government and should be taken up with the "bureau liquidation stocks de guerre," giving a list of medical supplies wanted with sufficient description to enable the supply department to identify items requested with regular stock. Sales may be made direct to all Governments of the Allied forces, Red Cross, Y. M. C. A., and Knights of Columbus. Requests from all these latter sources should be forwarded to the office of the chief surgeon, A. E. F., with a list of items attached. The final decision covering all sales is made by the general sales board under instructions of the War Department.

III. Accountability for medical supplies.—Section 3, Circular 3, office of the chief surgeon, line of communications, is hereby rescinded. All property received from whatever source, such as Red Cross, donation or purchase, will be taken up and accounted for in the same manner as regular supplies. All initial equipment of hospitals from the United States whose initial equipment came from the Red Cross sources should be taken up on property return.

Property belonging to the French Government, Service de Sante, to hotels under lease, etc., that has not been purchased by the United States Government will not be taken up on property return.

IV. Hospital funds—collection of amounts due from officer patients.—Referring to collection of amounts due to fund from officer patients as provided for in Bulletin No. 40, headquarters, Services of Supply, 1918, every effort will be made, by correspondence or other suitable method, to secure payment of amounts due from officers indebted for subsistence received while undergoing treatment, in order that the number of names placed upon the Quartermaster Corps stoppage circular may be reduced to a minimum. Attention is invited to the fact that Bulletin No. 40, headquarters, Services of Supply, 1918, affords a method of collection only after every other means of collection by direct correspondence has been exhausted without success, and that it was not the intention to relieve commanding officers, custodians of funds, or mess officers from responsibility in regard to such collections. In future, requests to place delinquent accounts upon stoppage circular must be accompanied by statement covering details of efforts previously made to collect such accounts.

V. Narcotics.—In view of that fact that soldiers of the Medical Department have been recently arrested for selling morphine and cocaine stolen from the Medical Department, the attention of officers is invited to the importance of carefully carrying out the regulations as prescribed in paragraphs 240 and 241, Manual of the Medical Department, for the care of narcotics. They should be kept at all times under lock and key, and the expenditures checked up to the end of each month against the prescriptions. Care should be taken not to carry on hand too large a stock of these drugs, and quantities in excess should be turned into a medical supply depot. Care should be taken not to dispense narcotic drugs by salvage, as it is difficult to keep track of them in this way. They should in all cases where practical be turned into medical supply depots direct.

VI. Hospital fund.—The second certificate mentioned in section 1, paragraph 5, Circular No. 64, dated January 7, 1919, is hereby amended to read as follows:

I certify to have received the sum of -----, from -----,
being the balance on hand this date of hospital fund of -----.

VII. *Daily reports of changes.*—Commanding officers of Medical Department formations will forward to this office carbon copies of their daily reports of changes on Form 647 and 648, S. D., A. G. O.

VIII. *Daily reports of casualties and changes.*—In the future daily reports of casualties and changes, on Forms 647 and 648, will be rendered separately for the permanent Medical Department personnel of the hospitals and for casual detachments of patients and convalecents. Consolidation of these reports on one sheet leads to confusion in the central records office.

IX. *Orders for return of Medical Department organizations to the United States.*—The provisions of paragraph 2, section 5, Embarkation Orders, No. 13, will be complied with only after receipt of formal orders for the return of the Medical Department organizations to the United States. A great deal of confusion is resulting at present through commanding officers of base hospitals and other Medical Department units reporting to G-1, these headquarters, after receipt of notice from this office that they were to prepare for return to the United States. This notification is not final notice, which is only given by G-4, these headquarters.

X. *Class B and C men.*—Many men evacuated from hospitals as of class B and C are still being received at the American embarkation center, Le Mans, presumably intended for return to the United States. The second depot division was discontinued at this place in accordance with telegram No. 446, G-1, Services of Supply, on December 7.

The above practice will be discontinued, and the men forwarded in accordance with General Orders, No. 5, general headquarters, January 5, 1919.

XI. *Colored soldiers.*—Complaint has been made that colored soldiers have been erroneously evacuated from hospitals to organizations consisting only of white men. This causes considerable difficulty in quartering and messing the colored men pending their departure for their proper organizations. The only colored divisions which have formed a part of the American Expeditionary Forces have been the 92d and 93d. Care will be exercised in evacuating this class of patients to prevent cause for complaint.

XII. *Lost baggage of patients.*—Paragraph 2, Circular Letter No. 24-A, in which it is directed that communications regarding lost baggage of patients should be addressed to lost baggage bureau, Tours, France, is changed to read "central baggage office, Gievres, A. P. O. 713," in accordance with General Orders 62, Services of Supply 1918.

XIII. *Members of the Army Nurse Corps.*—Since the appearance of members of the Army Nurse Corps, either singly or in groups, when they are traveling or after they reach the United States will be the only indication to the casual observer of the discipline, morale, and the standards of those in responsibility for them and the standards which they have made for themselves, it is most important that instead of relaxing their efforts now that the time of demobilization draws near, chief nurses should continue to make every effort to enforce the regulations in regard to the wearing of uniform.

XIV. *Priority lists in selecting cases for evacuation.*—Complaints have been made that hospitals have not made use of priority lists in selecting cases for evacuation. It is appreciated that many features enter into the selection of a group of men for transfer to the United States. It is desirable, however, that, when compatible with existing instructions, those who have been awaiting evacuation longest should be given preference to avoid discontent on the part of patients and any semblance of injustice.

XV. *Recruiting of military police.*—Authority has been given to the provost marshal general to established recruiting parties in all Services of Supply hospitals for the purpose of recruiting military police from class A men. Commanding officers of hospital centers and base hospitals will give all assistance possible to these parties.

XVI. *Ordnance property.*—The chief ordnance officer has directed that the following disposition be made of ordnance property upon abandonment of hospitals: Unserviceable web leather and miscellaneous equipment to intermediate salvage depot No. 8, St. Pierre de Corps; rifles, revolvers, and pistols to ordnance repair shop, Mehun; serviceable mess and personal equipment to intermediate ordnance depot No. 2, Gievres.

WALTER D. McCaw,
Colonel, Medical Corps, Chief Surgeon.

Circular No. 67.

AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON, SERVICES OF SUPPLY,
February 8, 1919.

I. *Typhoid and paratyphoid fever.*—Date of onset of typhoid and paratyphoid fever: All commanding officers of hospitals in the American Expeditionary Forces, when reporting suspected cases of typhoid or paratyphoid fever, or a case in which the diagnosis is based on clinical grounds, or a case proved by laboratory methods to be typhoid or paratyphoid, in compliance with Section XII, Sick and Wounded Reports, will add to the data now required by telegram the word "onset" and the date of the appearance of the initial symptoms of the disease; i. e., the date when the patient first felt really ill. This date is to be obtained by careful inquiry into the history of each case; the day when the patient first reports sick or when he is admitted to hospital or when he first goes to bed is not necessarily the date of onset of the disease and is not uncommonly a week or more after the true date of the onset of the disease as diagnosed by careful clinical history.

In order to accomplish effective control of typhoid and paratyphoid fever the personal attention of the commanding officer of every hospital formation in the American Expeditionary Forces must be given to this detailed report. The office of the chief surgeon can then give immediate and accurate information to surgeons of organizations which will permit of their discovery of cases and the tracing of the source of infection among the troops.

Typhoid and paratyphoid fever to be reported on clinical diagnosis: In order to comply with Section XII, Sick and Wounded Reports, the following will be observed:

(a) All suspected cases of typhoid and paratyphoid fever must be reported as such by telegram without waiting for clinical or laboratory confirmation.

(b) All cases which present a clinical picture of these diseases must be reported as clinical typhoid or paratyphoid as soon as the diagnosis of typhoid or paratyphoid is made.

(c) All cases in which the diagnosis of typhoid or paratyphoid is confirmed by bacteriological methods or by autopsy must be reported as proved cases of these diseases.

(d) Cases originally reported as suspected or clinical cases of typhoid or paratyphoid, if subsequently proved by laboratory methods or by autopsy to be cases of these diseases, must be again reported indicating that they are now proved cases.

(e) If cases originally reported as suspected or clinical typhoid or paratyphoid are found subsequently not to have either of these diseases, correction of report must be made, by telegram, giving change of diagnosis.

(f) Individuals who are found to be excreting typhoid or paratyphoid bacilli in stools or urine, but who have not been sick recently with a disease resembling typhoid or paratyphoid, must be reported as carriers. These individuals may be temporary or permanent carriers.

(g) Individuals who are found to be excreting typhoid or paratyphoid bacilli in stools or urine and who have recently had a febrile disease known to be typhoid or paratyphoid, or a disease which in the absence of proof to the contrary and in the face of known facts might have been typhoid or paratyphoid, must be reported as convalescent carriers.

In all instances reports to the chief surgeon will be by telegram.

II. *Evacuation of typhoid carriers.*—Whenever it becomes necessary or desirable to evacuate a carrier of typhoid or paratyphoid fever to the United States, the carrier shall be evacuated as a patient on sick report. The office of the chief surgeon shall be notified of the name, rank, organization, and home address of the patient as well as of the fact and date of such evacuation. A special communication calling attention to the fact that the man is a carrier and that special precautions must be taken to avoid spread of infection shall be sent with the transfer slip or field medical card which accompanies the patient.

III. *Reports.*—The attention of all medical officers is invited to the fact that personal reports of change of status should be rendered to this office as promptly as possible and that monthly personal reports should invariably be mailed on the last day of the month. These reports have been neglected to a great extent through the active operations of the past year, and it has been very difficult to keep track of locations and status of officers.

IV. *Daily reports of changes of hospital personnel and patients.*—The attention of all commanding officers of Medical Department units is invited to Section IV, General Order No. 16, c. s., general headquarters, A. E. F.

V. *Psychiatric department, hospital center, Allerey.*—Attention of all concerned is directed to the fact that the psychiatric department for the reception, observation, early treatment, and evacuation of mental cases is no longer in operation at the hospital center, Allerey. Paragraph 2 of Circular Letter No. 35-A should be corrected accordingly.

VI. *Base hospitals abandoned and being abandoned:* (1) The following listed base hospitals have closed their records and ceased to function on the dates shown in each case:

Base Hospital No. 20, Chatel Guyon (Puy de Dome), January 20, 1919.

Base Hospital No. 30, Royat (Puy de Dome), January 20, 1919.

Base Hospital No. 66, Neufchateau (Vosges), December 31, 1918.

Base Hospital No. 117, La Fauche (Hte. Marne), January 12, 1919.

(2) The following base hospitals are being abandoned:

Base Hospital No. 83, Revigny (Meuse).

Base Hospital No. 71, Vauclaire (Dordogne).

Base Hospital No. 202, Orleans (Loiret).

Base Hospital No. 236, Quiberon (Morbihan).

Base Hospital No. 218, Poitiers (Vienne).

(3) Hospitalization at the following places has been abandoned:

Pau (Basses Pyrenees).

Lourdes (Haute Pyrenees).

Caen (Calvados).

Autun (Saone et Loire).

VII. *Circulars Nos. 73 and 75, War Department.*—Circular No. 73, War Department, November 18, 1918, and Circular No. 75, War Department, November 20, 1918, relating to the discharge of officers and soldiers, mentioned in Circular No. 61, dated December 18, 1918, this office, have been republished in General Order No. 230, general headquarters A. E. F., December 16, 1918.

VIII. *Hospitals to be furnished with dubbin, or shoe polish.*—(1) By direction of the commander in chief, A. E. F., all hospitals will keep on hand, for use of hospital detachments and patients, a supply of dubbin, or shoe polish, to be used on the shoes. Commanding officers of hospitals will insist on shoes being treated with this material.

(2) Should a supply of dubbin, or shoe polish, not be on hand, requisition will immediately be made for this material.

WALTER D. McCaw,
Colonel, Medical Corps, Chief Surgeon.

Circular No. 68.

AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON, SERVICES OF SUPPLY,
February 8, 1919.

I. *Accountability for medical property.*—Disbursing officers, property officers at medical supply depots, including base storage depots, also at base hospitals and at schools, will continue to account for medical property, as required by existing orders.

Formal accountability for medical property is not required from any other officers.

Invoicing and receipting for supplies transferred by disbursing officers, property officers at medical supply depots, base hospitals, and schools will be done in the manner prescribed by Army Regulations and Manual for the Medical Department, but the receipts given by all other officers than those above mentioned will be for the sole purpose of clearing the accountability of the issuing officer.

Officers who are relieved from formal accountability for medical property which is in their care or under their control must remember that their duty to protect the interest of the Government is in no way diminished thereby. Attention is called to Section II of General Orders, No. 74, as to their duty in this connection and as to the means which will be taken to enforce proper care and use of Government property.

II. The attention of all officers coming to Tours is invited to the fact that the address of the finance and accounting division is No. 4, Rue de Clocheville, and that the sick and wounded division is at No. 17, Place Forre-le-Roi.

III. All medical officers are directed to remove the following drugs from salvage before turning same in to salvage depots: Morphine, cocaine, heroin, codeine, chloral, and opium preparations.

These drugs will be sent to the nearest medical supply depot by courier, with list covering shipment; depot officer concerned receipting thereon.

WALTER D. McCaw,
Colonel, Medical Corps, Chief Surgeon.

Circular No. 69.

AMERICAN EXPEDITIONARY FORCES,
CHIEF SURGEON'S OFFICE, SERVICES OF SUPPLY,
February 17, 1919.
TYPHOID-PARATYPHOID FEVERS

I. INTRODUCTION

In view of the appearance and continued incidence of fevers of the typhoid-paratyphoid group in many units of the American Expeditionary Forces during the past five months, it is deemed essential to review this subject at the present time, particularly from the viewpoint of early diagnosis, prevention, and control.

The occurrence and distribution of typhoid-paratyphoid in our troops has constantly and continuously been brought to the attention of all medical officers serving with the A. E. F. through the medium of the Weekly Bulletin of Diseases. It would appear, however, that many officers have utterly failed to grasp the significance of these reports and warnings, a fact which may be due to a false sense of security under the popular belief that vaccination against typhoid and paratyphoid gives a complete immunity even in the midst of gross unsanitary conditions.

Notwithstanding the fact that typhoid and paratyphoid fevers are endemic in the United States, and in spite of our extensive experience with these diseases during the Spanish-American War and, later, during the period of mobilization on the Mexican border, it is evident that many medical officers have gained but little knowledge of the fundamental principles underlying prevention and control. It is also quite evident that some medical officers are grossly careless and neglectful of their duties and responsibilities as medical officers and sanitarians.

This office realizes fully that the United States has raised, within a short period of time, an army of several millions of men who have been poorly instructed in personal hygiene and sanitation; it realizes that 2,000,000 of these men have been brought to France where they have encountered environmental conditions differing entirely from those existing in the United States; it is fully recognized that military necessity has at time rendered sanitary control extremely difficult, especially during the stress of active combat.

To our regret, be it said, the high standards of sanitation and personal hygiene set by the Medical Department during the past 10 to 15 years have not been lived up to during the past 1½ years. This has been due to a combination of factors, the more important of which have been the lack of facilities and materials, transportation difficulties, and insufficient training and personnel. However, many medical officers serving with combatant and Services of Supply units have been able to overcome all handicaps and have by wise counsel and by eternal vigilance succeeded in keeping their units in excellent fighting trim.

The actual physical fighting is now at an end, and the time-worn excuse that "there is a war on" will no longer be tolerated. But the fight against disease still continues.

The greater part of the American Expeditionary Forces is now relatively stationary in training areas or with the armies of occupation, where definite sanitary measures can be instituted and enforced, where instruction of the line troops can be carried out, and where opportunity is presented to initiate rules of personal hygiene. Medical officers will therefore be held responsible for the proper supervision of the health of troops.

Carbon copies of all general recommendations of medical officers covering sanitation and personal hygiene, promulgated officially as orders and memoranda by superior authority, will be mailed to this office.

II. SUMMARY OF TYPHOID PARATYPHOID INCIDENCE IN THE AMERICAN EXPEDITIONARY FORCES

In order that all medical officers in the American Expeditionary Forces may have a somewhat comprehensive view of the occurrence of these fevers in the American Expeditionary Forces, the following brief review is presented.

(a) From June 1, 1917, to June 1, 1918, but few cases occurred. The rate was well within the limits to be expected in view of the sanitary conditions under which the troops were of necessity living. The cases were sporadic and only occasionally did secondary cases develop.

(b) In July, 1918, a replacement unit consisting of 248 men, from Camp Cody, N. Mex., reached England with typhoid prevailing extensively; 98 men, or 39.5 per cent, had typhoid, and the case death rate was 8.42 per cent.

It was evident from the investigation that the men were exposed to infection through contaminated drinking water while en route to the port of embarkation in the United States. The unit had been vaccinated a few months prior to the occurrence of the epidemic. Most of the patients presented the typical clinical features of typhoid. The percentage of positive bacteriological findings from the blood, feces, and urine was low, as no laboratory work could be done until late in the course of the disease.

(c) In August, 1916, a small but severe epidemic occurred in a detachment of engineer troops stationed at Bazoilles. In this unit 15 cases of typhoid occurred, with a death rate approximating 10 per cent. Typhoid was endemic in the civil population, and the epidemic was very definitely traced to a cook in the mess of this engineer detachment who remained on duty as a cook for five days after the onset of the symptoms. The epidemic was recognized in its early stages, and in all patients the disease was confirmed bacteriologically by positive cultures from the blood and feces.

(d) During the Chateau Thierry offensive diarrhœal diseases were very prevalent in the troops engaged (approximately 75 per cent). It was demonstrated bacteriologically, in this area, that the prevailing intestinal diseases were simple diarrhœa, bacillary dysentery, typhoid, paratyphoid A and B. The sick and wounded from this sector were evacuated to base hospitals in various parts of France. Very soon thereafter this office began to receive reports of cases of typhoid, paratyphoid, and bacillary dysentery from base hospitals. In practically all instances the patients had been evacuated from the Chateau Thierry sector. The high incidence of intestinal diseases in this sector was due to the entire disregard of the rules of sanitation. "Military necessity" and the impossibility of supplying auxiliary labor troops, at that time, prevented immediate police of the battle fields. In some of the cases involved in this series the diagnosis of dysentery or typhoid was made by the pathologist at autopsy. The percentage of positive bacteriological findings was low, as the correct diagnosis, if made, was not usually arrived at until late in the course of the disease.

(e) Both dysentery and typhoid-paratyphoid fevers were demonstrated to have prevailed to some extent in our troops after the St. Mihiel offensive, but the epidemics of influenza and pneumonia prevailing at that time overshadowed all other medical admissions.

(f) Following the offensive in the Argonne sector, typhoid and paratyphoid began to be reported from practically all divisions engaged in that offensive. It is quite evident that the initial cases were due, in large part, to drinking infected water. The initial cases, however, in large part were not, in most instances, promptly diagnosed, and secondary cases from contact began to occur. In some divisions either the initial exposure was not great, the organizations were under good discipline, or the medical officers had a proper conception of their duties and responsibilities and but few cases occurred. In other instances the contrary was true, and many cases have occurred. As examples of the two extremes may be cited the — Division, in which 5 cases occurred between October 1, 1918, and February 1, 1919, and the — Division, in which 115 cases occurred in the same period.

More than 300 cases of typhoid-paratyphoid may be attributed to the Argonne offensive. Eight hundred and seventy-four typhoids and paratyphoids have been reported in

the American Expeditionary Forces since October 1, 1918. The percentage of confirmatory laboratory diagnoses has been low on account of the fact that the clinicians frequently failed to suspect the disease in its early stages.

(g) A small but severe epidemic occurred in the Joinville concentration area in December and January. In a group of Medical Department units (evacuation and mobile hospitals and sanitary trains) concentrated there 75 cases occurred, with a case death rate of approximately 20 per cent. The cases were suspected in the early stages of the disease, and the percentage of positive findings by culture of urine or feces has been greater than 75 per cent. The cause of this epidemic has not been completely analyzed as yet, but there is but little question that it was due to the use of infected drinking water.

III. REPORTS OF CASES

If epidemics are to be recognized in their incipency and measures initiated to control and prevent further extension, it is manifestly of the utmost importance that reports of suspects and proven cases be transmitted to the medical officers of organizations directly concerned at the very earliest possible moment. The large number of troops involved, methods of evacuation, delays in transmission of reports, necessary censorship regulations, frequency of troop movements, laxity in making reports, unwarranted delay in making diagnoses, and other factors have tendered to hamper this most important instrument for the control of transmissible diseases. The medical officers charged with the supervision of the health of all organizations must know at the earliest possible moment of the diagnosis or provisional diagnosis of typhoid or paratyphoid in a member of his organization, and for this diagnosis he must depend on the ward surgeon in the camp, evacuation, mobile, base, or other hospital unit of which the patient has been evacuated. Ward surgeons and chiefs of medical service in hospitals charged with the care of these patients do not appear to comprehend their responsibility in this matter. As a matter of fact, they are jointly responsible with the medical officers of the organization for any epidemics occurring in a command if they delay, in the least, in making diagnoses or in reporting suspects or positive cases. The records of this office show that patients with typhoid have passed successively through camp, field, evacuation, and base hospitals without any documentary evidence that typhoid or paratyphoid were even suspected. There are records of a stay of two weeks or more in a single base hospital without diagnosis, and not a few records are on file showing that it remained for the pathologist to make the diagnosis at the autopsy table. If a tentative or positive diagnosis of typhoid or paratyphoid does not reach the medical officer of an organization until two or three weeks after the evacuation of the individual from the command, the damage already is done, additional individuals already are infected, and the problem of control becomes all the more difficult. If, on the contrary, ward surgeons in hospitals are keenly alive to their duties and responsibilities, will suspect typhoid and paratyphoid in all fevers of undetermined origin, will endeavor to confirm their suspicions by early blood culture, will promptly report all clinical cases as such and positive cases as such, the necessary information can be transmitted immediately to the medical officer of the organization concerned, who can in turn institute measures for the prevention of secondary cases.

In order that reports of cases of typhoid and paratyphoid may be transmitted more promptly to the medical officer attached to organizations, the following procedure will be adopted:

(a) Commanding officers of Medical Department units caring for the sick will be held responsible for reporting promptly by telegraph, as already provided for in Section XII, Sick and Wounded Reports; all suspected, clinical and proved cases of typhoid and paratyphoid. The commanding officers of such hospitals will hold the chiefs of their medical services directly responsible for the prompt submission of diagnoses in these cases. Any laxity or incompetency in this respect will be immediately reported to this office for necessary action.

(b) When reporting these cases, in addition to the data now required by telegraph, the word "onset" followed by the date of appearance of the initial symptoms of the disease will be included in each case. In securing these data it must be understood that the date of "onset" is not necessarily the day on which the patient first reported sick or the date on

which he was admitted to the hospital, but rather should be regarded as the day when the patient first had any symptoms indicative of the disease.

(c) In reporting cases of typhoid or paratyphoid, in compliance with paragraph (a) above, the following classification will be observed:

1. All suspected cases of typhoid and paratyphoid will be reported as "typhoid or paratyphoid suspects."
2. All cases which present a clinical picture of these diseases will be reported as "clinical typhoid or paratyphoid," using the term "clinical typhoid or paratyphoid."
3. All cases in which the diagnosis of typhoid or paratyphoid has been confirmed by bacteriological methods or autopsy will be reported as "proved typhoid or paratyphoid."
4. Individuals who are found to be excreting typhoid or paratyphoid bacilli in their stools or urine and who have recently had a febrile disease presenting the clinical symptoms of typhoid or paratyphoid, will be reported as "convalescent typhoid or paratyphoid carriers."
5. Individuals who are found to be excreting typhoid or paratyphoid bacilli in their stools or urine, but who have not been sick recently with a disease resembling typhoid or paratyphoid, will be reported as "typhoid or paratyphoid carriers."
6. Cases originally reported as suspects or clinical cases of typhoid or paratyphoid and which have subsequently been proved, by laboratory methods or autopsy, to be one of these diseases will be again reported, stating that they are now proved cases. The telegram reporting such proved cases will indicate clearly that they have formerly been reported as suspects or clinical cases.
7. If cases originally reported as suspects or clinical typhoid or paratyphoid are subsequently found not to have been one of these diseases, these cases will be reported by telegraph showing change of diagnosis. In all telegrams reporting such change of diagnosis, definite information will be submitted indicating that they have been reported previously as suspects or clinical cases.

(d) All reports outlined above will be sent by telegraph to the chief surgeon, A. E. F. If the hospital unit reporting such cases is attached to one of the armies, a duplicate of this report will be submitted to the chief surgeon of the army concerned, in such manner as he may indicate. If the hospital unit is under the orders of a section surgeon, surgeon of the district of Paris, or surgeon of the American embarkation center at Le Mans, a duplicate of this report will be submitted to the section, district, or embarkation center surgeon, in such manner as he may indicate.

Chief surgeons of the armies will establish close liaison with base, evacuation, and camp hospitals in the immediate vicinity of their commands, but not a part of their commands, to which patients from their commands are to be evacuated. If cases of typhoid or paratyphoid from armies are diagnosed in such camp, evacuation, base, or other hospitals, the commanding officers of such units will, in addition to the reports called for above, make immediate report of such cases by telephone, telegraph or courier to the chief surgeon of the army concerned.

8. The special attention of all medical officers is invited to section 189, Article III, Manual of the Medical Department, quoted below, which will be strictly complied with.

189. A report will be furnished in every case of typhoid fever or paratyphoid fever occurring in an officer, enlisted man, or civilian employee who has received the typhoid vaccine, describing in detail the method of arriving at diagnosis.

Special blank forms covering the information to be submitted will be obtained on request to this office.

IV. CLINICAL DIAGNOSIS OF TYPHOID AND PARATYPHOID FEVERS

In view of the fact that the ordinary clinical picture of typhoid-paratyphoid is very frequently profoundly modified in vaccinated individuals, it is considered essential to enumerate briefly the usual clinical manifestations of these fevers, atypical modes of onset, differential diagnosis, and modifications of the usual clinical manifestations in vaccinated individuals.

1. *Clinical manifestations of typhoid and paratyphoid.*—Typhoid fever in the unvaccinated is commonly characterized clinically by symptoms due to the gradual development

of a general bodily infection. The onset is insidious, with lassitude, malaise, gradual step-like rise in temperature with slight morning remissions, until at the end of the first week a continuous fever of from 103° to 105° F. has been obtained. The beginning of the attack is usually associated with anorexia, headache, and frequently with diarrhoea, abdominal distress, and epistaxis. The pulse is not increased in proportion to the temperature, is of low tension and dicrotic. The tongue is coated and white and the abdomen distended and tender. From the seventh to the tenth day the rash appears in the form of slightly raised flattened papules of from 2 to 4 mm. in diameter, which can be distinctly felt, are of a rose red color, and fade on pressure. These rose spots, characteristic of typhoid and paratyphoid, appear singly or in crops, usually first on the skin of the abdomen and lower thoracic region, but may occur only on the back or extremities. The individual rose spot persists for from two to three days, after which it fades, leaving a brownish stain which persists for some time. Toward the end of the first week the spleen enlarges, and its edge can be distinctly felt below the costal margin.

At the end of 10 days the symptom complex clinically characteristic of typhoid—continuous fever, rose spots, and enlarged spleen—is usually established. To this should have been added laboratory findings of absence of leucocytosis and in the majority of instances a positive blood culture, which occurs most frequently during the early stage of the disease. One negative blood culture will not suffice, but repeated examinations at 48-hour intervals will be made in suspicious cases.

During the second week there is continued high fever, with slight morning remissions. The pulse becomes rapid and loses its dicrotic character, the patient becomes dull and stupid, the lips are dry, the tongue is dry and covered with a dirty brownish coat and tremulous. Abdominal symptoms when present, tympanites and diarrhoea, are more pronounced, and the clinical picture becomes one of intense toxemia. In the third week, in favorable cases, the morning remissions in temperature become more marked, the fever becomes distinctly remittent in type, and toward the end of this period a gradual fall in temperature by lysis is noted. Rose spots cease to appear. In severe cases the pulse is weak, ranging from 110 to 130, and pulmonary complications, especially pneumonia and hypostatic congestion, may occur. The patient is dull and apathetic, and low muttering delirium and subsultus tendinum are common. During the fourth week convalescence begins, the temperature gradually reaches normal, the abdominal symptoms subside, the tongue becomes clear, and the desire for food returns. In severe cases convalescence may be delayed until the fifth or even the sixth week, in which case the fever continues high during the fourth week, and it is only toward the end of this period that marked daily remissions make their appearance.

In individuals previously vaccinated against typhoid, but who have completely lost their immunity, infection similar to that found in the unvaccinated occurs, giving rise to the symptom complex described above as characteristic of typhoid fever.

Infections occurring in the vaccinated individual who still possesses a certain degree of resistance to infection result in the appearance of atypical clinical pictures, such as abortive types of typhoid and paratyphoid in which the constitutional symptoms are mild but with slight febrile reaction of atypical type and few if any rose spots. The onset may be either insidious, with headache, loss of appetite and fatigue, or acute and associated with chills, vomiting, intestinal cramps, and diarrhoea. Fever may be wholly absent or evanescent in character and determined only if observations are made within the first 48 to 72 hours. A low type of temperature, with daily fluctuations of from 98.6° to 100.4°, suggestive of the presence of tuberculous disease, may persist for a week or 10 days. It is in this class of cases that blood cultures taken early in the course of the disease, and repeated if negative, frequently give definite information concerning the nature of the infection. Ambulatory types of typhoid are not uncommon, and the first indication of the existence of the disease may be furnished by the occurrence of intestinal hæmorrhage or perforation.

The vaccinated individual protected against general systemic infection may still act as a carrier of typhoid infection, and frequently shows clinical manifestations of local disease of some portion of the gastro-intestinal tract, while the characteristic symptom complex of typhoid fever due to general infection, namely, continued fever, rose spots, and enlarged spleen, may be wholly absent.

2. *Distinctive complications.*—Intestinal hæmorrhage occurs usually during the third and fourth weeks. The onset is marked by a sudden and frequently pronounced fall in temperature associated with increased gravity of the general condition and a rise in pulse rate.

Intestinal perforation occurs usually during the third or fourth week. Patients whose sensorium is not too clouded complain of sudden paroxysmal abdominal pain, usually referred to the right hypogastric region. Signs of peritoneal irritation rapidly become manifest. Vomiting is common. Hiccough and irritability of the bladder, with frequent micturition, may be noted. Physical examination of the abdomen reveals tenderness and muscle rigidity most marked in the right hypogastric or iliac region. Obliteration of liver dullness is frequently present and constitutes an important sign. Acute abdominal symptoms associated with a suddenly appearing leukocytosis are indicative of perforation. The occurrence of intestinal hemorrhage or signs of intestinal perforation in an individual giving a history of previous ill health should always lead to the suspicion of the existence of typhoid.

3. *Atypical modes of onset.*—(a) Acute onset, with symptoms simulating meningitis. Lumbar puncture differentiates.

(b) Acute onset with intense, usually generalized bronchitis or symptoms suggestive of lobar or broncho-pneumonia.

(c) With chills, fever, vomiting, cramplike pain in abdomen, sometimes localized in right iliac fossa and suggesting appendicitis.

(d) With symptoms of acute nephritis. Attack begins suddenly, with nausea, vomiting, pain in lumbar region, diminution in secretion of urine, which is highly colored and contains albumin and casts.

(e) Special mention should be made of the ambulatory type of typhoid in which the symptoms are slight, consisting simply of headache and lassitude associated with mild gastro-intestinal disturbances. The patient is at no time confined to his bed, and intestinal hemorrhage or perforation may furnish the first clue with regard to the existence of typhoid.

(f) In the above atypical modes of onset early blood cultures are of importance in differentiation.

4. *Paratyphoid fevers.*—The paratyphoid fevers, due to infection with A or B organisms, are evidenced clinically by the same general symptomatology as that of typhoid. They, however, as a rule, run a much milder course and the intense toxemia of typhoid, evidenced by marked apathy, muttering delirium, and subsultus tendinum is seldom present. The onset of paratyphoid is frequently more abrupt, with acute gastro-intestinal symptoms resembling food poisoning. The intestinal symptoms are as a rule more marked in cases of infection with paratyphoid B than in cases in which paratyphoid A is the causative factor. The fever in paratyphoid is not of as long duration nor is it as continuous as in typhoid, but is more distinctly remittent in type. Enlargement of the spleen, rose spots, and absence of leukocytosis are, as a rule, present in all three infections. Attempts have been made by some authorities to distinguish between the eruptions of paratyphoid A, paratyphoid B, and typhoid. Thus the spots in paratyphoid A are said to be larger, more macular in type, of a darker reddish hue, and to correspond more closely to the eruption of measles. However, histologically the rash is the same in all three instances, and it is doubtful if a clinical distinction in type of eruption can be maintained. Rose spots may be wholly lacking or may be profuse and widely distributed over the body surface. The occurrence of relapses is more frequent in paratyphoid than in typhoid proper, and particularly is that true in connection with type A infections. In contradistinction to the relapse of typhoid, that of paratyphoid is frequently more severe than the original attack. The distinction between mild typhoid, paratyphoid A, and paratyphoid B can be made definitely only by the isolation of the infecting organism from cultures of the blood, urine, or stools.

5. *Differential diagnosis—Influenza.*—Many cases originally diagnosed as influenza in the American Expeditionary Forces have subsequently proven to be typhoid. The symptoms which the two diseases have in common are: Continuous fever without localizing symptoms and slow pulse associated with absence of leukocytosis. The more abrupt onset, the intensity of the headache, the severe pain in the back and eyeballs, and the early prostration occurring in influenza are distinctive. Supposed influenza in which the fever persists for more

than four days and which is not associated with signs of respiratory involvement, such as bronchitis, usually most extensive in the lower lobes, a broncho or lobar pneumonia should be viewed with suspicion. It should be remembered that a general bronchitis is not uncommon in typhoid. The appearance of rose spots should determine typhoid. Intestinal types of supposed influenza should always be considered as possible typhoid until proven otherwise.

Acute miliary tuberculosis.—A family history of association with tuberculous individuals, a personal history of previous attack of pleurisy or pulmonary hemorrhages, physical signs of old tuberculous pulmonary lesions, cyanosis appearing early in the disease associated with increased rate of respiration, a greater irregularity of temperature curve, and a more rapid pulse with absence of dirotism suggest acute miliary tuberculosis. Roentgenograms of the chest and blood cultures frequently give valuable differentiation.

Septicemia.—In cases of late typhoid admitted to the hospitals during or after three weeks of profound toxemia, together with the, by this time, distinctly remittent temperature, may suggest septicemia. The slight daily fluctuation in the general condition of the patient together with the absence of chill and leukocytosis, suggest typhoid. Blood cultures will always be made in such cases and, if negative, cultures of the stools will be made for the presence of typhoidlike organisms.

6. Local and unexplained gastro-intestinal derangements, gastritis, acute or chronic, diarrhea, dysentery, gastro-enteritis, enter-colitis, colitis, appendicitis, cholecystitis, and acute catarrhal jaundice, all occurring with or without fever, should be regarded with suspicion when admitted from commands in which cases of typhoid or paratyphoid have occurred, and examination of the stools for the presence of typhoidlike organisms should be made.

Medical officers will see that all cases of gastro-intestinal derangement enumerated above, as well as all fevers of undetermined origin, are subjected to careful clinical and laboratory supervision. They will under no conditions be left in quarters, but will be sent at once to camp, evacuation, mobile, or base hospitals where accurate observation of temperature at four-hour intervals will be recorded for a period of at least four days. Blood cultures will be taken in every case of fever of undetermined origin in which the temperature has persisted for a period of 48 hours and, if negative, will be repeated provided unexplained fever persists from the second to the fourth day.

Daily physical examinations of such cases will be made, special attention being paid to physical examination of the abdomen for enlarged spleen, distention, and tenderness, either general or localized. A careful survey of the entire surface of the body will be made for the possible appearance of rose spots.

The precautions appropriate for a case of typical proved typhoid or paratyphoid fever must be observed in all instances where atypical or undetermined fevers are held under observation, awaiting clinical or bacteriological diagnosis of specific enteric infections. The frequency with which atypical, mild, unrecognized cases of typhoid and paratyphoid fever have occurred in the American Expeditionary Forces among vaccinated men makes it absolutely essential to surround all such cases of undetermined fever with the same precautions which it is found necessary to apply to establish typhoid or paratyphoid patients, to avoid contact infections in the wards among other patients and hospital personnel.

7. Temperature records, clinical notes, and the original reports of laboratory findings in all cases of typhoid, paratyphoid, fevers of undetermined origin, and the above-mentioned list of gastrointestinal disorders will accompany the patient if transferred to another medical unit, and will be preserved and forwarded to the office of the chief surgeon as per instructions contained in section VI, paragraphs 6-7, Sick and Wounded Reports for American Expeditionary Forces, September 15, 1918. In no instance will the clinical notes, temperature, and laboratory records of these cases be destroyed upon the completion of the case.

V. LABORATORY DIAGNOSIS OF TYPHOID AND PARATYPHOID FEVERS

Bacteriological procedures are of great value (1) for the certain and early diagnosis of suspected cases, (2) to determine carrier state in convalescent positive cases, (3) to detect carriers in otherwise normal individuals.

Blood cultures offer the most certain method for early diagnosis of undetermined fevers, and it should be kept in mind that the earlier in the disease the blood culture is taken the more

likely is the result to be positive; thus, in positive typhoid fever the chance of successful blood culture declines from 90 per cent during the first week to 40 per cent during the third week. In paratyphoid A fever, because of the frequently short and mild febrile period, the prompt and early blood culture is all the more necessary. Relapses are more common in paratyphoid than in typhoid, and taken at such a time blood culture yields positive results in every case.

The following method of blood culture is recommended as being suitable in all cases of fever of undetermined etiology.

(a) When laboratory facilities are at hand, take 10 c. c. of blood from a vein at the elbow. Place 3 c. c. in each of two flasks containing 100 c. c. of plain broth. Place 1 c. c. in tube of agar (melted and cooled to 45° C.), immediately mix and pour plate. Place remainder of blood in dry sterile test tube to separate serum for such serological tests as may be suggested.

The two flasks and plate are incubated and examined the following day. Transplants are made to plain agar slants, or, better, Russell's double sugar agar. In case of development of Gram-negative motile bacilli or agar slants, emulsions should be made and agglutination tests done with immune sera for final identification.

Frequency of nonagglutinability of recently isolated typhoid cultures should be kept in mind.[/] Negative blood culture in suspected typhoid fever means little. Repeat if clinical conditions indicate.

(b) If the blood culture specimen can not be taken directly to the laboratory, filtered sterile ox bile is most useful, 5 c. c. in a tube. To such sterile ox bile 5 c. c. of blood is added, the tube closed with a sterile paraffin cork, carefully packed, and sent for examination to the nearest laboratory. Bile medium is furnished in chest No. 1, transportable laboratory, United States Army, expeditionary force model. Additional supply of this medium may be obtained as needed from central medical department laboratory, A. P. O. 721.

Bacteriological examination of feces is second only to blood culture as an important means of positive diagnosis. It is especially important in paratyphoid B fever.

Typhoid or paratyphoid carriers.—Typhoid and paratyphoid patients excrete the bacilli, frequently with their urine and practically always in their feces. This is most likely to occur during the third and fourth weeks of the disease; the condition may persist throughout convalescence and not infrequently longer. It is therefore important not to release the convalescent typhoid or paratyphoid fever patient until he ceases to excrete these bacilli.

Three negative cultures of the urine and feces at six-day intervals should be required before release of patient, the first not earlier than one week after temperature curve has become normal.

Some persons who have never had a clinical history of the disease may excrete typhoid or paratyphoid bacilli. It is important to detect such carriers in any occupation, but especially among cooks and handlers of foodstuffs. In such a carrier survey, two examinations should be done on each individual.

For release of patients, therefore, and detection of carriers, the examination of feces is of especial importance. It is a procedure that properly requires the most careful attention of the bacteriologist. A bit of fresh feces the size of a pea (or, better when feasible, 1 c. c. of liquid stool, obtained, if diarrhoea is not already present, by administration of a saline cathartic) is mixed with 10 c. c. of plain broth or sterile salt solution, then allowed to stand and sediment for 15 minutes. One or more loopfuls are taken from the top and placed on the surface of one plate of hardened Endo medium. This droplet is carefully carried over the surface by means of a glass elbow rod or similar spreader, and without further inoculation the same rod is used to seed a second Endo plate. In this way a satisfactory separation of the colonies may be secured. After incubation overnight, suspicious colonies are fished to plain agar slants or, better, Russell's double sugar and the identification completed by agglutination tests.

Evacuation of typhoid carriers.—Whenever it becomes necessary or desirable to evacuate a carrier of typhoid or paratyphoid fever to the United States, the carrier shall be evacuated as a patient on sick report.

[/] All strains of organisms of the typhoid paratyphoid group are of special interest and should be sent to the Central Medical Department Laboratory, A. P. O. 721.

The Widal test, in view of previous vaccination with T. A. B. vaccine, has been generally held of little or no value; however, it should be stated that the determination of agglutinin titer of patient's serum at intervals of one week and the demonstration of progressive and marked increase of agglutinin content of the blood offers, especially in the absence of positive blood culture, excellent evidence as to the etiology of the diseases. Thus in typhoid fever an agglutinin titer (Widal test) of 1 to 40 during the first week of the disease may advance to 1 to 1,280 during convalescence. In paratyphoid B fever the titer frequently advances to 1 to 2,560; however, in paratyphoid A fever it may not reach 1 to 640. Formalinized and standardized bacterial suspensions of *B. typhosus*, *B. paratyphosus* A, and *B. paratyphosus* B may be obtained on request from the central Medical Department laboratory, A. P. O. 721.

Post-mortem bacteriology.—At autopsy, on suspected cases, cultures should be made from the mesenteric lymph glands and from the spleen.

VI. PATHOLOGY

1. The significant gross pathology of typhoid fever can be briefly summarized as an acute process found in the lymphoid elements of the intestine (chiefly the ileum) and in the enlargement and softening of the lymph nodes in the mesentery and mesocolon. These nodes in the immediate neighborhood of the lower end of the ileum, the appendix, and cæcum usually show the most marked change. The opened intestinal tract reveals hyperplasia of all the lymphoid elements, such as Peyer's patches and the solitary follicles. There may be in most unusual cases only hyperplasia of these elements, but as a rule they show injection, exudation, and rather extensive ulceration, particularly in the lower end of the ileum. The lower third of the ileum is frequently the location of an ulcerated Peyer's patch or solitary follicle that may have perforated or may have become the source of considerable hemorrhage. The mucosa of the appendix and the cæcum are, in about one-third of the cases, also the seat of typhoid ulcers.

The spleen is usually enlarged and the pulp is semidiffuent. The parenchymatous organs are somewhat enlarged and have a cooked appearance, suggesting cloudy swelling of a moderate or extreme degree. Broncho-pneumonia is frequently present as a terminal lesion. This represents the usual list of anatomical findings disclosed to gross examination; therefore, on opening the abdomen, the first important gross features that attract attention are the size of the lymph nodes in the mesentery and the upper part of the mesocolon and the size and consistence of the spleen.

In children these structures may be misleading and in adults afflicted with tuberculosis a confusing gross picture can be offered, but in the Army of the American Expeditionary Forces, composed of young adults, any such picture found at autopsy should be thoroughly investigated. Such investigation calls for the removal of the intestine and an examination of the intestinal mucosa for lesions related to the lymphoid elements. Any change noted should be followed with supporting evidence gained by bacteriological examination.

It should be kept in mind that the American Army has been vaccinated against typhoid, and as a result the gross pathological picture may not be as clear as in unprotected individuals. Indeed, several protocols received indicate that there are fewer gross lesions in the intestine and that they are prone to appear in the ileum at points very near the ileocecal valve and even in the appendix and cæcum. Other records indicate that death probably occurred during a relapse since there was evidence of a few almost healed ulcers near the location of one or more acute ulcers, one of which had been perforated.

Cases of typhoid may escape attention at autopsy if early and complete regional examinations are not conducted and recorded in a methodical manner, and it is imperative that the pathologist support any suspicion of typhoid fever gained on gross examination by a well conducted post-mortem bacteriological examination. Cultures taken from the gall bladder and from the lumen of the bowel may offer the only positive findings of a "carrier" of the disease. Cultures offering the pathologist the best support may be taken from the spleen and lymph nodes in the drainage path of actual intestinal lesions.

Cases possessing the pathology and bacteriology of typhoid should be entered under the cause of death at the close of protocol as typhoid fever, and then, if desired, followed in parenthetical manner with any important sequel present, such as "perforation." Several

protocols have been received in which the complete pathological and bacteriological pictures of typhoid fever were recorded, but the cause of death was entered as "peritonitis," "perforation of the intestine," "broncho-pneumonia," "acute enterocolitis."

Attention is directed to Section XVII of the pamphlet Sick and Wounded Reports (effective September 15, 1918). All diagnoses should conform to these instructions if a proper record of disease is to be made.

VII. PREVENTION AND CONTROL OF TYPHOID AND PARATYPHOID FEVERS

Typhoid fever is increasing in the American Expeditionary Forces; so are the paratyphoid fevers.

Vaccination is a partial protection only and must be reenforced by sanitary measures.

Faulty conditions of sanitation that may not be dangerous now will become serious menaces when the warm weather sets in. There is still time to correct many of these conditions. If this is not done, many soldiers will not get back to the United States after completion of their arduous service, and it will be in part your fault and our responsibility.

The means of conveyance are water and food. Water may be contaminated by drainage from latrines and indiscriminately deposited defecations. Food may be contaminated by hands of carriers, by flies that come to it from latrines and uncovered feces; therefore:

Remember that all water in France is regarded as contaminated unless it is under constant supervision of water supply personnel. See that General Order 131, general headquarters, 1918, is carried out. Do not give orders only; personally assure yourself that chlorination is properly carried out. The responsibility ultimately falls upon those charged with sanitary control and not upon the enlisted man who mixes the hypochlorites of lime with the water. Study the means of prevention of drinking at unauthorized sources. The best way to do this is to see that an adequate supply of supervised water is conveniently available wherever men work or live. Other means are the marking of water points; the removal of faucets; the placing of guards, and last, but most important, the education of the men.

Remember that the most dangerous carriers are the ones that work in the kitchens. Enforce the washing of hands by kitchen personnel before the preparation and serving of food. Do not leave this to orders alone. Have a reliable officer or noncommissioned officer supervise this and see that the means of washing are on hand. Also remember that many cooks who have been found to be carriers have often given histories of recent intestinal disturbance; therefore, inspect your kitchen personnel at least twice a week and remove all those who are suffering or have recently suffered from diarrheas. Repeated attacks of diarrhea are particularly suspicious.

Remember that flies breed in manure, feces, and offal of many kinds. Policing of camp and the proper disposal of all such filth will keep down the number of flies. A campaign of such policing, if now undertaken, should go far to yield results by spring. Flies alone can not spread these diseases if latrines are covered and access to feces are prevented. Look at the lids of your latrines. Correct the conditions which lead to uncovered feces in camps. Keep the food covered so that any flies that get through this cordon can not get at it.

Remember that an outbreak of diarrhoea may mean typhoid fever. At any rate the occurrence of epidemic diarrhoea shows that there is a hole in your sanitary plan.

Remember that, even though your camp is a model one, the neighboring civilian population may be a source of danger. Try to keep informed of typhoidlike disease in the civilian population where you are stationed.

Remember that from the sanitary point of view the first case is the most important one. If you evacuate a suspicious case and don't hear what it has turned out to be, make inquiry through the available channels.

CONTROL

1. Upon the occurrence of a single case of typhoid or paratyphoid fever in a command, reinvestigate all the above conditions and correct any deficiencies discovered in the barrier or protection above described.

Examine all vaccination records and administer a single dose of triple lipo-vaccine to all in whom there is the slightest doubt concerning completion of required vaccination.

Request bacteriological carrier examination of your kitchen personnel from the nearest available laboratory. This had best be done through the responsible sanitary authorities.

Before this has been done reinspect your kitchen personnel and remove all who give a history of recent diarrhœas or other intestinal disturbance.

Prohibit the use of all uncooked vegetables and unboiled milk.

Investigate the conditions of the neighboring civilian population as to prevalence of typhoid or typhoidlike fevers.

2. When two or more cases occur in the same command within the same two weeks, revaccinate the entire command, in addition to the above precautions.^a If the outbreak takes an epidemic proportion, add to these precautions the hand washing of all men after defecation.

Further measures of control must be determined after epidemiologic study of the individual situation.

Whenever typhoid or paratyphoid fever occurs in any command, the medical officer will address the officers and the men, at either roll call or retreat, instructing them in the mode of spread of intestinal diseases, in the seriousness of the situation, and in the simple methods of personal hygiene, the importance of cleanliness, and the purpose of the sanitary regulations instituted for control of these diseases.

3. The special attention of all officers of the Medical Department is invited to sections 184 and 185, Article III, Manual of the Medical Department. Compliance is enjoined.

4. All previous instructions from this office in conflict with regulations prescribed herein are rescinded.

WALTER D. McCaw,
Colonel, Medical Corps, Chief Surgeon.

Circular No. 70.

AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON, SERVICES OF SUPPLY,
February 20, 1919.

I. *Hospital centers and base hospitals no longer operating.*—(1) Supplementing Section VI, Circular 67, the following is a complete list of hospital centers and base hospitals that have ceased operating:

HOSPITAL CENTERS

Angers (activities taken over by Base Hospital No. 85).

Clerment-Ferrand.

Commercy (activities taken over by Base Hospital No. 91).

Langres (activities taken over by Base Hospital No. 53).

Pau.

Vittel-Centrexeville.

^a Directions for vaccination with triple T. A. B. lipo-vaccine are being issued with the vaccine.

BASE HOSPITALS

No.	Location	No.	Location
1.	Vichy (Allier).	35.	Mars (Nievre).
2.	Etretat (Seine Inferieure), with British Expeditionary Force.	36.	Vittel (Vosges).
3.	Vauclaire (Dordogne).	37.	Dartford, England.
4.	Rouen (Seine Inferieure), with British Expeditionary Force.	38.	Nantes (Loire Inferieure).
5.	Boulogne (Pas de Calais), with British Expeditionary Force.	39.	(Mobile Hospital No. 39).
6.	Bordeaux (Gironde).	41.	St. Denis (Seine).
7.	Tours (Indre et Loire).	42.	Bazailles (Vosges).
8.	Savenay (Loire Inferieure).	43.	Blois (Loire et Cher).
9.	Chateauroux (Indre).	44.	Mesves (Nievre).
11.	Nantes (Loire Inferieure).	45.	Toul (Meurthe et Moselle).
12.	Camiers (Pas de Calais), with British Expeditionary Force.	46.	Bazailles (Vosges).
13.	Limoges (Haute Vienne).	47.	Beaune (Cote d'Or).
14.	Mars (Nievre).	48.	Mars (Nievre).
15.	Chaumont (Haute Marne).	49.	Allerey (Saone et Loire).
17.	Dijon (Cote d'Or).	50.	Mesves (Nievre).
18.	Bazailles (Vosges).	52.	Rimaucourt (Haute Marne).
19.	Vichy (Allier).	58.	Allerey (Saone et Loire).
20.	Chatel Guyon (Puy de Dome).	61.	Beaune (Cote d'Or).
21.	Rouen (Pas de Calais), with British Expeditionary Force.	62.	Mars (Nievre).
22.	Beau Desert (Gironde).	66.	Neufchateau (Vosges).
23.	Vittel (Vosges).	67.	Mesves (Nievre).
24.	Limoges (Haute Vienne).	68.	Mars (Nievre).
25.	Allerey (Saone et Loire).	70.	Allerey (Saone et Loire).
26.	Allerey (Saone et Loire).	72.	Mesves (Nievre).
27.	Angers (Maine et Loire).	76.	Vichy (Allier).
28.	Limoges (Haute Vienne).	83.	Revigny (Meuse).
29.	Tottenham, England.	84.	Perigueux (Dordogne).
30.	Royat (Puy de Dome).	94.	Pruniers (Loire et Cher).
31.	Contrexeville (Vosges).	112.	Brest (Finistere).
32.	Contrexeville (Vosges).	115.	Vichy (Allier).
33.	Portsmouth, England.	116.	Bazailles (Vosges).
34.	Nantes (Loire Inferieure).	117.	La Fauche (Haute Marne).
		204.	Hursley Park, England.
		206.	Remorantin (Loire et Cher).
		236.	Quiberon (Morbihan).
		238.	Rimaucourt (Haute Marne).

(2) The following hospital centers are shortly to be abandoned:

Allerey, to be abandoned when patients are evacuated.

Beaune, to be abandoned and buildings turned over to general headquarters for use as a school. Base Hospital No. 77 to remain at this location to care for sick of the school.

Limoges, to be abandoned when patients are evacuated.

Vichy, to be abandoned when patients are evacuated.

(3) Additional lists will be published in succeeding circulars as base hospitals and hospital centers cease to operate.

II. *Resharpening blades.*—Machine horse clipper blades in use by veterinary hospital units should be sent to Medical Department repair shop No. 1, Paris, for resharpening. These blades upon being resharpened will be returned to the unit in question.

III. *Final report on Form No. 30.*—When a base hospital, camp hospital, or medical detachment is disbanded, a final report on Form No. 30, A. G. O., will be rendered the original forwarded to The Adjutant General of the Army, Washington, D. C., and two copies direct to the adjutant general, general headquarters, A. E. F. These returns will be made out in accordance with the printed instructions on Form No. 30, A. G. O. The records of events will show the authority for the discontinuance or breaking up of the hospital or detachment and the date and the disposition of the personnel.

IV. *The following instructions will govern with reference to requisitions for engineer stores.*—Requisitions for engineer stores originating with the Services of Supply must be submitted to and acted upon by the local engineer section officer of the C. of C. and F., who, after taking the necessary action, forwards the requisition to the nearest, or the specially designated, engineer depot where it is to be filled. Requests emanating from the following sections will be forwarded to the engineer section officer at the addresses given below:

Base section No. 1, A. P. O. 701.

Base section No. 2, A. P. O. 705.

Base section No. 4, A. P. O. 760.

Base section No. 5, A. P. O. 716.

Base section No. 6, A. P. O. 752.

Base section No. 7, A. P. O. 735.

Intermediate section (west), A. P. O. 713.

Intermediate section (east), A. P. O. 708.

Advance section, A. P. O. 731.

V. *Records of returning organizations.*—Organizations returning to the United States are required by embarkation instructions No. 13 to take with them all records pertaining to the organization as an organization. This has not been done in a number of cases. Steps will be taken to insure compliance with these instructions.

VI. *Correct Mail Address.*—The postmaster at A. P. O. 717— requests that members of the medical Corps, Sanitary Corps, Veterinary Corps, Army Nurse Corps, and enlisted men of the Medical Department send their correct mail address to the medical section, A. P. O. 717, upon each change of station or change to another organization. It is desired that the commanding officers of hospitals and medical detachments have this information placed on bulletin boards.

VII. *Nurses.*—In addition to the instructions regarding nurses traveling given in Circular No. 65, January 19, 1919, the following is to be noted. When it is necessary for nurses to change trains at Tours or to remain at that station between trains, commanding officers of hospitals are instructed to telegraph to the headquarters commandant, Services of Supply, stating the probable hour of arrival of the nurses and the number, in order that arrangements for their accommodation may be made. The Red Cross officials at Tours are doing all in their power to assist nurses going through that city, but to prevent embarrassment it is absolutely necessary that the probable numbers expected and the time of their arrival be received beforehand.

VIII. *Disposition of surplus subsistence on disbanding of hospitals.*—(1) The following decision of the Quartermaster Department is published for compliance of all hospitals:

(2) In view of the facts set forth in letter of the chief surgeon, A. E. F., to the judge advocate, A. E. F., of the 28th of January, 1919, indicating deficits on operations hospital funds, the Quartermaster Corps is willing to purchase back from hospital funds all surplus subsistence on hand which is in a good condition, and which was purchased from the Quartermaster Corps, that may be in the possession of Medical Department units at the time of their disbanding or when evacuating to the United States.

IX. *Rates of commutation for patients.*—Attention of all commanding officers of hospitals is called to General Order No. 19, general headquarters A. E. F., dated January 29, 1919, which changes the rates of commutation for patients in hospital.

X. *Clearance certificates.*—Attention of all commanding officers of hospitals is invited to Bulletin No. 40, headquarters, Services of Supply dated October 22, 1918. In connection with the issuance of clearance certificates, it is essential that this office (finance and accounting division), be notified immediately of indebtedness of a deceased officer or of an officer departing for the United States, and that this office also be notified immediately upon expiration of the two months period in the case of officers outlined in paragraph 3 of Bulletin No. 40.

WALTER D. McCaw,
Colonel, Medical Corps, Chief Surgeon.

Circular No. 71:

AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON, SERVICES OF SUPPLY,
March 8, 1919.

I. *Hospital centers and base hospitals no longer operating.*—(1) In addition to list given in Section I—Circular 70, the following hospital centers and base hospitals have ceased operating:

HOSPITAL CENTERS

Beaune (Base Hospital No. 77 to be returned to United States as skeletonized organization, and personnel retained to operate Camp Hospital No. 107. Buildings have been turned over to general headquarters for use of American Expeditionary Forces University).

Allerey (Base Hospital No. 99 to be returned to United States as skeletonized organization, and personnel retained to operate Camp Hospital No. 108. Buildings being turned over to general headquarters for use of American Expeditionary Forces University).

BASE HOSPITALS

No.	Location	No.	Location
10.	Le Treport (Seine Inf.), with British Expeditionary Forces (All American Expeditionary Forces base Hospitals with British Expeditionary Force have ceased operating.)	92.	Kerhuon (Finistere). ^a
40.	Sarisbury Court, England. (All American Force base hospitals in England have ceased operating.)	96.	Beaune (Cote d'Or).
77.	Beaune (Cote d'Or).	97.	Allerey (Saone et Loire).
		105.	Kerhuon (Finistere). ^a
		112.	Kerhuon (Finistere). ^a
		202.	Orleans (Loiret).
		218.	Poitiers (Vienne). Reverts to former status as Camp Hospital No. 61.

(2) The following base hospitals are shortly to be abandoned: Base Hospitals Nos. 63, Chateauroux (Indre); 71, Vauclaire (Dordogne), and 109, Vichy (Allier).

II. *Communications.*—The attention of commanding officers and of chief Nurses is called to the fact that official communications from nurses or women civilian employees addressed to the chief nurse or the director of nursing service, A. E. F., must be forwarded promptly, whether approved or disapproved and with reasons for the approval or disapproval expressed.

III. *Mail addressed to patients in hospitals which are to be discontinued.*—(1) All hospitals discontinued will forward a roster of patients evacuated at the time the hospital was discontinued, together with their correct forwarding address, to the central post office, Bourges.

(2) In case a hospital is relieved by another unit, the commanding officer of the hospital relieved will furnish the mail orderly of the hospital relieving his organization the mail orderly record on hand of all past and present personnel and patients, including all evacuated patients, with their correct forwarding address.

IV. *Death of prisoners of war.*—On the death of a prisoner of war in any hospital, notification will be immediately made to the commanding officer, central prisoner of war inclosure No. 1, A. P. O 717, giving place, time, name, number, and description of prisoner.

V. *Wound stripes.*—At a recent inspection by the commander in chief it was noted that there was a shortage of wound stripes at certain hospitals. He directs that an adequate supply of these articles be kept in all hospitals. Requisitions will accordingly be made for wound stripes in order that they may be on hand at all times.

VI. *Evacuation of prisoners of war from hospitals.*—When members of prisoner of war labor companies become sick and are sent to hospitals they are considered as still members of their companies. Upon evacuation from hospitals on a duty status they will be returned to their original organization or to the central prisoner of war inclosure, whichever is more convenient, and not to a labor company to which they have never belonged.

VII. *Pneumococcus vaccine.*—The following additional instructions relative to records to be kept when pneumococcus lipo-vaccine is given will supplement those laid down in paragraph 5, section 1, Circular No. 59, office chief surgeon, A. E. F., series 1918.

^a Never operated as independent unit.

When large numbers of individuals from the same unit are given prophylactic inoculations of pneumococcus vaccine, the records may be consolidated on nominal check list showing the character of vaccine used, batch number, serial number of individual, name, age, organization, date of administration.

The consolidated lists should be forwarded to the office of the chief surgeon, A. E. F. The fact that lipo-vaccine has been given and the date of the administration should be entered on the individual record and pay book as well as on the service record of each soldier.

VIII. *Disposition of ordnance property.*—Section XVI, Circular 66, is amended to read as follows:

The chief ordnance officer has directed that the following disposition be made of ordnance property upon the abandonment of hospitals: Unserviceable web, leather, and miscellaneous equipment to intermediate salvage depot No. 8, St. Pierre-de-Corps; rifles, revolvers, and pistols to ordnance repair shops, Mehun.

Serviceable mess and personal equipment will be disposed of as follows: Hospitals and medical units stationed east of a line drawn north and south through Gievres, to Gievres. Hospitals and medical units in base section No. 1 to base ordnance depot No. 1, Montoir; base section No. 2 to base ordnance depot No. 4, St. Sulpice; base section No. 4 to base ordnance depot No. 1, Montoir; base section No. 5 to base ordnance depot No. 1, Montoir; base section No. 7 to base ordnance depot No. 4, St. Sulpice; intermediate section, west of Gievres to Montoir, base ordnance depot No. 1; advance section to intermediate ordnance depot No. 2, Gievres.

IX. *Medical organizations under orders for return.*—In order that section 1, general staff, these headquarters, may be informed concerning the whereabouts and movements of medical organizations under orders for return to the United States, the commanding officer of any separate Medical Department unit will report by wire to G-1, headquarters, Services of Supply, all movements subsequent to receipt of orders to prepare for embarkation.

X. *Salvage of quartermaster department material.*—The Quartermaster Department requests that in the future the commanding officers of all hospital centers and base hospitals operating independently will not ship or endeavor to save any articles of clothing, shoes, or other quartermaster's material which can not be placed in a serviceable condition by repairs, or which have no sales value amounting to considerably more than the cost of handling and transportation.

XI. *Patient's laundry.*—Circular Letter No. 71, office of the Surgeon General, February, 1919, is quoted, as follows:

1. Amendments of paragraphs 222 and 267, Manual for the Medical Department, have been approved as follows, and will be promulgated by formal change in due course: Par. 222, strike out the words "before it is put away" in the first sentence, so that that sentence shall read: "The soiled clothing of patients will be washed as a part of the hospital laundry (par. 267)."

Par. 267, change second clause so as to read: "Second, the washable clothing of patients under treatment in hospital (par. 222)."

2. Commanding officers of hospitals will govern their action accordingly.

XII. *Records of inventions and licenses.*—Circular Letter No. 59, office of the Surgeon General, dated January 29, 1919, is quoted for the information of all concerned:

1. This office has received a request from the patent section, office of the director of purchase, storage, and traffic, for information in regard to records of inventions and licenses. In order to enable this office to furnish the information desired, you are requested to invite the attention of all medical, dental, veterinary officers, enlisted men, Medical Department, and civilian employees serving under your direction, to paragraph 4, General Orders, No. 93, War Department, 1918, and direct such officers and enlisted men, and civilian employees as may come within the purview of that order to furnish the following information to this office, attention executive officer:

(a) Brief titles of all inventions relating to military affairs made by them.

(b) Brief description of each invention, together with a statement as to whether or not it has been submitted to the War Department to be patented, and whether formal tender or licenses to the United States to use the same has been made.

2. It is requested that this matter be expedited.

WALTER D. McCaw,
Colonel, Medical Corps, Chief Surgeon.

Circular No. 72.

AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON, SERVICES OF SUPPLY,
March 15, 1919.

I. The following general instructions will govern when units are abandoned and equipment ordered turned into medical supply depots:

Upon receipt of instructions from the chief surgeon designating depot or other station where supplies and equipment will be turned in, the following instructions will be carried out:

(a) The medical supply officer will in each case be advised in advance, by wire, as to the approximate number of cars to be turned into his depot, also date cars go forward, and statement in general of contents of each car. The supply officer should also be advised of the car number and O. D. T. number. In every case, copy of loading list should be inclosed in an envelope and tacked on the ceiling or some other convenient place in each car, showing contents of that particular car.

(b) Owing to the scarcity of lumber for packing material, sandbags have been obtained from the Engineer Department for the purpose of packing linen. These sandbags will be available for issue at intermediate medical supply depot No. 2, Gievres; advance medical supply depot No. 1, Is-sur-Tille; and medical supply depot, Montierchaume. Upon receipt of orders to abandon hospital and turn in equipment, necessary requisition will be submitted for the necessary number of these sacks. Tests have been made as to the capacity of sandbags to be used, and the following results obtained:

One sack will hold 30 sheets, 30 pajama suits, 20 mattress covers, 48 bath towels, 120 hand towels, 120 pillowcases.

(c) Bundling of linens or other preparation of such articles for shipment: All used bed linen and hospital clothing will be freshly laundered and blankets, when necessary, will be washed and in every case the latter will be sterilized before being turned into the depot.

Blankets will be sorted as to color and quality and then bundled as follows: Each blanket is folded once from side to side and then twice from end to end, making a surface 21 by 34 inches. They are then securely tied in bundles of 25, with folded sides all in one direction.

Sheets will be folded as commercially received, which is as follows: Each sheet is folded from side to side twice; then endways three times and then sideways once, making a fold about 8 by 12 inches. They are then tied up in bundles of 10, or a multiple thereof, with the folded sides all in one direction.

Pillowcases will be folded as follows: Each pillowcase is folded to one-third its width on each side and this again folded once end to end, making a surface about 7 by 18 inches. They are then put up in bundles of 12, with folded ends in one direction, and tied. Four of these smaller bundles are again tied up in one bundle, making a total of 48 pillowcases in the larger bundles.

Towels, hand, will be folded and tied in bundles in exactly the same manner as the pillowcases, with this exception—two towels will be folded together and but six of the doubled towels will be placed in the smaller bundles. Size of towels when folded will be about 6 by 18 inches. Total of 48 towels in large bundles.

Towels, bath, will be put up in the same manner as the small bundles of hand towels. Size when so folded is 8 by 24 inches. Total of 12 towels in a bundle.

Pajamas should be folded as follows: The coat, buttoned, is placed bosom downward. The pants, with the legs folded together, are placed lengthways on top of coat, projecting legs of trousers being folded over so as to bring such fold even with tail of coat. The sides are then folded over to one-third the width of coat and sleeves brought down lengthways of garment. It is then folded once to bosom size and then once again to half bosom size, making a package about 8 by 12 inches. The suits are then tied in bundles of 5 or in multiples of 5, all folds in one direction.

Pillows should be sorted as to class—as hair, feather, cotton, and French or American. Each class is then tied up in bundles of 10.

Care should be taken to see that all bundles are neatly packed and securely tied with material of sufficient strength to obviate breaking.

When shipped or stored, mattresses will be sorted and classed as to kind—such as hair, felt or cotton, or excelsior, and as to make as American or French or the quartermaster type.

II. *Loss of sick and wounded reports.*—Owing to the increasing number of monthly sick and wounded reports that are being lost by the transportation department, it is requested that all monthly sick and wounded reports that are too bulky to be sent by mail will hereafter be sent by messenger instead of by freight or express service.

III. *Short course in reconstructive facial surgery.*—A short course in reconstructive surgery of the face, facial cavities, and eyelids will be offered at Paris by Drs. Pierre Sebelean, Victor Morax, and Fernand Le Maitre. This instruction will bear special reference to war casualties. Instruction will be didactic, demonstrative, clinical, and operative on the cadaver. Classes will be limited to 12, and the courses will continue three weeks. A fee of about 50 francs will be charged to cover expenses due to the use of cadavers.

Any eye, ear, nose, or throat surgeons desiring this course and who can be spared without replacement should forward application to this office, stating the date on which it is desired to start. The courses will begin March 24 and every three weeks thereafter.

IV. *Disposition of chronic carriers of typhoid and paratyphoid.*—All chronic carriers of typhoid or paratyphoid A or B bacilli will be evacuated to the United States as patients, accompanied by a statement of the specific diagnosis and records of the laboratory proof of the carrier state.

V. *Antirabies treatment at Base Hospital 57, Paris.*—Any member of the American Expeditionary Forces who has been bitten by an animal infected or proved to be rabid should be sent at once, with a complete history, to Base Hospital 57, in Paris, where anti-rabies treatment will be carried out. For full details as to precautions to be observed in establishing diagnosis of rabies in the attacking animal and for advised emergency treatment of the wound of the patient, see page 31, Bulletin on Transmissible Diseases and Use of Therapeutic Sera in American Expeditionary Forces, May, 1918, to be obtained from chief surgeon's office. Note that American Red Cross Military Hospital No. 2, where treatments have been carried out heretofore, has been closed and that Base Hospital 57 will be used instead.

WALTER D. McCaw,
Brigadier General, Medical Department,
Chief Surgeon.

Circular No. 73.

AMERICAN EXPEDITIONARY FORCES,
OFFICE OF THE CHIEF SURGEON, SERVICES OF SUPPLY,
France, March 23, 1919.

I. *Physical examination of permissionnaires.*—(1) The surgeons of all organizations are directed to make a complete physical examination of all men going on leave the day preceding or the day on which the men depart for leave areas.

II. *Sick and wounded reports.*—(1) The attention of all medical officers is again invited to paragraph 2, section 11, Manual Sick and Wounded Report of the American Expeditionary Forces, which directs that all monthly sick and wounded reports be forwarded direct to the chief surgeon, A. E. F., Services of Supply. Strict compliance with these instructions is enjoined upon all.

(2) No copy of the weekly medical report of sick and wounded patients is required by the chief surgeon, A. E. F., Services of Supply. These reports should be forwarded to the central records office at Bourges. (See General Order 100, general headquarters, A. E. F., June, 1918.)

(3) Commanding officers of hospitals and surgeons of infirmaries functioning as hospitals who are required to render monthly sick and wounded reports will, in the future, advise this office by letter, or on Form 51-A, if no cases were completed during the month. In other words, a nil report will be required from all organizations hospitalizing patients for more than three days.

III. *Telegraphic report to central records office on death of officer or enlisted man.*—(1) On the death of an officer or enlisted man, immediate telegraphic report will be made by

commanding officer of hospital in which death occurs to the central records office, Bourges. This report will give name, rank, service, organization, serial number of enlisted man; time, place, and cause of death; whether in line of duty or not; whether result of his own misconduct or not. Confirmation copy of this telegram will be forwarded by courier service.

IV. *Service records of evacuated patients.*—(1) Attention is again called to provisions of General Order, No. 23, general headquarters, 1919, regarding the procurement of service records of patients to be evacuated, and the method of transmitting the record to the station or hospital to which the patient is sent. These requirements are not being carefully followed. Immediate steps will be taken to insure their strict obedience.

V. *Material for the prospective medical history of the war.*—(1) Information has reached this office that in some instances medical officers, upon leaving the service, are taking with them official charts, photographs, models, and pathological specimens, etc., which were prepared in connection with their official duties while on duty in various hospitals or camps.

(2) It is desired that responsible medical officers inform all subordinate medical officers that all medical records, charts, drawings, models, and pathological specimens, etc., as well as all writings relating to cases in hospitals, are the property of the Medical Department of the United States Army, and must not be removed from camps or hospitals by any officer without the authority of the Surgeon General of the Army in each specific case.

(3) It is desired that every effort be made to collect and forward to the Surgeon General's office all photographs, drawings, sketches, models, and pathological specimens, etc., in hospitals or camps which may be of use or value in the prospective medical history of the war. All pictures should be forwarded to Col. Louis C. Duncan, M. C., Army Medical Museum, Washington, D. C. Models and pathological specimens should be forwarded to Col. Charles F. Craig, M. C., curator, Army Medical Museum, Washington, D. C.

VI. The following memorandum is quoted for the information of all concerned:

Subject: Personnel ordered to the first replacement depot and base ports.

1. In view of the fact that the majority of casual officers being released for return to the United States will be needed for duty with casual companies and casual organizations returning to the United States, instruct all officers whom you may release and order to the first replacement depot at St. Aignan-Noyers (Loire-et-Cher) or to the ports of embarkation that they may expect to be held at those places for assignment to such duty. This is to be done so that the officers may not expect to be forwarded at once from the first replacement depot to ports of embarkation or to sail on the first transport after the arrival at a port of embarkation.

2. All soldiers becoming surplus as a result of the abandonment of depots, stations, camps, etc., who are sent to the first replacement depot at St. Aignan-Noyers (Loire-et-Cher) are subject to reassignment. Many such men now arrive at the depot with the impression that they are immediately to be returned to the United States. In order, therefore, to prevent soldiers getting such impression, instruct all class A soldiers that you may release and all organizations and detachments that are sent to the first replacement depot, because their services are no longer required on their present duty, that they are available for reassignment, that they have no priority for going home, and the fact of their being sent to the first replacement depot does not mean that they are to be immediately embarked for the United States.

3. Soldiers released for return to the United States under the provisions of Section III, General Orders No. 8, headquarters services of supply, 1919, do not fall under the above classes as such soldiers are released for immediate return to the United States and are given immediate priority for return to the United States.

By order of the commanding general:

E. E. BOOTH,
Assistant Chief of Staff, G-1.

VII. *Medical department entertainment.*—(1) It is contemplated that the Medical Department at these headquarters will shortly produce an entertainment, and information is desired of any members of the Medical Department who may have talents along these lines. In submitting these names the qualifications should be given in detail so as to enable this office to pick out the best in the Medical Department in France.

VIII. *Report of officers admitted, evacuated, discharged, or died.*—(1) In order to enable the statistical division, adjutant general's office, to answer promptly the many inquiries now being made, all base and camp hospitals will forward direct to the statistical division, adjutant general's office, general headquarters, by courier mail, a daily list of all officers admitted,

evacuated, discharged, or who have died. The list will give the name, rank, service, and organization, and place to which sent, if evacuated or discharged. This information may be sent on any form. Copies of the reports that are at present being made, which show the same data, will be acceptable.

IX. *Association of nurses and enlisted men.*—The attention of the Medical Department personnel is called to the fact that there is no authority in regulations for any such distinction between officers and enlisted men as is implied by a ruling that makes it an offense for a nurse to associate with the enlisted man and not with the officer. The association of nurses with men is to be governed by the needs of the service, by the rules and customs of polite society, and by constant consideration for the good name of the Nurse Corps of the Medical Department of the Army and of American representation in France and not by social distinctions founded on military rank. Any instructions to the contrary are revoked.

WALTER D. McCaw,
Brigadier General, Medical Department,
Chief Surgeon.

Circular No. 74.

AMERICAN EXPEDITIONARY FORCES,
CHIEF SURGEON'S OFFICE,
March 28, 1919.

I. *Economy in use of blank forms.*—(1) All officers of the Medical Department are directed to see that the utmost economy is exercised in regard to blank forms. Requisitions received in this office for blank forms indicate that more are requested than are needed, or that a large wastage occurs. In either case remedial measures should be applied promptly so that the present large expenditure for printing may be curtailed as much as possible.

II. *Shoe-shining and tailoring establishments to be instituted in all hospitals possible.*—(1) The commander in chief has noticed that there is an absence of smartness in the appearance of personnel and especially of convalescent patients. This criticism reflects greatly on the care and attention given to proper military duties by the medical officers of hospitals. The commanding officers of all hospitals will take proper steps to correct this deficiency.

(2.) With this in view, places will be established in each hospital where men will be able to shine their shoes, and wherever possible tailor shops where they will be able to have their uniform repaired and pressed, will be instituted.

III. *Physical classification of officers.*—(1) Reports reaching this office indicate that some medical officers, members of classification boards, are both lax in their classification of officers examined and ignorant of existing instructions. The ease with which officers can apparently be classified and sent home for conditions which would not have seriously interfered with the performance of their duties prior to the cessation of hostilities is causing undesirable adverse comment and is materially interfering with the integrity of the special services and staff departments of the American Expeditionary Forces.

IV. The following circular has been received from the Surgeon General and is published for the information of medical officers. Communications on this subject will not be sent through this office.

Criticisms and suggestions in re medical service of the Army.—(1) A board of medical officers, consisting of Brig. Gen. Francis A. Winter, Brig. Gen. John M. T. Finney, and Col. L. A. Conner, has been appointed to consider criticisms and suggestions concerning the medical service of the Army.

(2) With a view to correcting defects in and increasing the efficiency of the department, officers of the Medical Department, including those of the Medical, Dental, Veterinary, and Sanitary Corps, are invited to submit to the board any criticisms they may have to make of the present system and methods, together with suggestions for improvements therein.

(3) Communications on this subject should be sent to Brig. Gen. Francis A. Winter, Army Medical School, 462 Louisiana Avenue NW., Washington, D. C.

(4) Camp surgeons, surgeons of ports of embarkation, department surgeons, commanding officers of hospitals, and other medical officers are requested to call the attention of officers to the provisions of this letter.

By the direction of the Surgeon General:

C. R. DARNALL,
Colonel, M. C., United States Army.

V. *Abandonment of hospitals.*—When a base, camp, evacuation, or mobile hospital is abandoned, the commanding officer of the hospital will wire the chief surgeon's office the date upon which the hospital records are closed and the hospital ceases to function. Attention of all commanding officers concerned is invited to General Orders, No. 15, headquarters services of supply, A. E. F., dated March 8, 1919, reference to the disposition of records.

VI. *Manual of the Medical Department to govern preparation of sick and wounded reports after embarkation for the United States.*—(1) The attention of commanding officers of medical units and surgeons of organizations is invited to the fact that the Manual of the Medical Department will govern in the preparation of all sick and wounded reports after embarkation for the United States. The system used in the American Expeditionary Forces will no longer apply.

VII. *Carriers of meningococcus and diphtheria bacilli.*—(1) Chronic carriers of meningococcus and of proved virulent diphtheria bacilli now under observation or treatment in hospitals in the American Expeditionary Forces will be evacuated to the United States as patients, promptly. No diphtheria bacilli carrier will be evacuated unless the virulent character of the bacilli has been proved by appropriate tests upon the guinea pig.

VIII. *Autopsy protocols.*—(1) It is important, in view of the continued spread and high incidence of typhoid and paratyphoid fevers, that protocols of all autopsies be forwarded to the director of laboratories, A. P. O. 721, within 24 hours of completion of the autopsy.

(2) Failure of the pathologist at the hospital to appreciate the full significance of lesions of the enteric group of diseases in men dying with other more striking lesions, or with a clinical picture not recognized as that of typhoid fever, can be corrected by review in the office of the director of laboratories.

(3) In this way, several incipient epidemics of typhoid have been disclosed; and because of failure to send in autopsy reports promptly, at least one of the existing local outbreaks was unrecognized for two weeks.

WALTER D. McCaw,
Brigadier General, Medical Department,
Chief Surgeon.

Circular No. 75.

AMERICAN EXPEDITIONARY FORCES,
CHIEF SURGEON'S OFFICE,
April 10, 1919.

I. *Preparation of records for final separation of officers and enlisted men from the service of the United States Army.*—(1) Medical officers preparing records of physical examination of officers and enlisted men on final separation from the service in the United States Army are especially cautioned to observe the provisions of General Orders, No. 230, general headquarters, 1918, and General Orders, No. 20, general headquarters, 1919.

(2) Attention is directed to paragraphs 1 and 2 (War Department Circular 93, November 27, 1918) quoted in General Orders, No. 20, general headquarters, 1919.

(3) When disabilities are found which, in the opinion of medical examiners, were existent prior to induction into the service, even though the men examined were evidently placed in class A when inducted, a notation will be made setting forth reasons upon which their findings are based, in order that the examination at induction and that at discharge may be reconciled.

(4) In view of the fact that men under treatment for physical training will not be discharged until the board of review certifies that the maximum of improvement has been obtained, or that the physical disabilities have not been exaggerated or accentuated, when men are discharged with disabilities a statement will be made to the effect that further treatment will offer no prospect for improvement in physical condition.

II. *Men evacuated without service records.*—(1) Many complaints are arriving in this office from different organizations that men are being and have been evacuated without the service records being requested (see General Orders, Nos. 5 and 23, general headquarters), and without the organization being notified that the men are not to return to their organization. Regarding the cases in the past, organizations will be immediately notified as to the

name of men who have been evacuated from their organizations without service records, and in the future no man will be evacuated without the organization being notified and the service record being requested.

III. *Prophylaxis and prophylactic stations.*—(1) The following telegram from the commander in chief has been received by this office and is published for the information and guidance of all concerned:

HEADQUARTERS, A. E. F., April 8, 1919.

CHIEF SURGEON, A. E. F., *Tours*:

During my inspections, following points have been brought to my attention and should be remedied with all possible speed and vigor. All the following criticisms and directions apply with emphasis to leave areas everywhere.

A. (1) Prophylactic stations are often not well organized, equipped, or administered, and this fact alone would bring discredit upon the treatment rather than confidence in its use. The equipment should be on a par with that supplied for other functions of the Medical Department. Medicines should be prepared by the pharmacist and renewed at least every second day. Warm water for washing should always be on hand to prevent delay in the administration of the treatment.

(2) Treatment should be under direction and supervision of thoroughly trained attendants and given absolutely according to directions posted in the treatment rooms. Attendants must be carefully selected from the most intelligent and reliable men of detachments and especially trained in administration of these treatments. Their appearance, deportment, and speech should always be such as to place prophylaxis treatment on a par with other medical surgical procedures and their number should be sufficient to allow necessary reliefs.

B. (1) Separate rooms or small buildings should be provided where treatments can be administered in private, with separate accommodations for officers where possible.

(2) The number and distribution of stations should be such as to make prompt and convenient treatments always possible. The number at most points is entirely insufficient.

C. (1) Individual packets should be supplied to soldiers in convoy or other duties which may carry them out of touch with prophylaxis stations. This is not at present generally done.

(2) The physical inspections are not being systematically and efficiently carried out in cases of undiagnosed and untreated venereal disease among the troops arriving at certain stations.

(3) The education of commands through lectures by medical officers on personal hygiene is neglected at many posts. Lectures illustrated by diagrams and drawings are one of the most effective means of urging continence.

(4) Little or no attempt is made by surgeons to locate sources of infections. Every effort should be made in every case to trace and eliminate the source by cooperation with military police and civil authorities, and this is the surgeon's duty.

(5) Little attention is being paid at rest points for leave and troop trains and houses of prostitution are in many cases not put out of bounds and no prophylaxis facilities are provided.

(6) Medical officers fully provided with facilities for administering prophylaxis should accompany all troops and leave trains.

PERSHING

Medical officers will be held responsible for any lack of supplies.

WALTER D. McCaw,

Brigadier General, Medical Department,

Chief Surgeon.

DIRECTIONS FOR GIVING PROPHYLAXIS

(To be posted in all prophylactic stations)

1. Patient will urinate and proceed as follows:
2. Wash hands.
3. Roll up shirt and drop trousers and drawers to knees.
4. Pull back foreskin and wash head of penis very thoroughly with warm running water and liquid soap, great care being taken to cleanse undersurface around "G string" and back of head. After this, wash shaft of penis and adjacent part of body. If there is no running water, clean basin with clean water and liquid soap will be used. The basin, after use, will be washed with water and then partially filled with bichloride solution (1 to 1,000) and allowed to stand for at least 15 minutes before being used again.
5. While foreskin is drawn back, wash penis, particularly the head, with warm bichloride solution (1 to 1,000). This is best done by allowing the solution to flow over it.

6. The attendant, without touching genitals, will inject slowly one teaspoonful of a 2 per cent solution of protargol or a 10 per cent solution of argyrol into the penis and, as the syringe is withdrawn, he will direct patient to close the opening of the penis with the thumb and forefinger and retain solution for five minutes.

7. Pull back the foreskin; rub one teaspoonful of calomel ointment all over the head of the penis and the inner surface of the retracted foreskin, being careful to rub it in on the under-surface, around the "G string" and in the furrow behind the head. The rubbing of this ointment should continue for three minutes. After this the surplus ointment will be well rubbed over the shaft of the penis.

8. The penis is then wrapped in a toilet paper and the patient directed not to urinate for at least four hours.

9. If more than three hours have elapsed since exposure, the patient, after having taken the regular prophylaxis, will be directed to report twice a day for two days for an injection of 1 per cent of solution of protargol. This will be held in 10 minutes.

Circular No. 76.

AMERICAN EXPEDITIONARY FORCES,
CHIEF SURGEON'S OFFICE,
April 21, 1919.

I. *Identification disks of prisoners of war patients.*—(1) Identification disks of prisoners of war patients undergoing treatment will not be removed from the patient except in case of death.

(2) In event of the latter, one portion of the disk will be buried with the body or attached to the grave marker; the other will be transmitted to the central records office, prisoners of war information bureau.

(3) The information bureau reports that many hospitals have been forwarding them in all cases. Such practice will be discontinued, as it causes considerable confusion.

II. *Disposition of unserviceable medical property.*—(1) Commanding officers of hospitals and other medical units, upon receipt of orders to abandon and turn in equipment, will forward without delay to this office a list of all unserviceable property on hand. Upon receipt of this information, instructions will be given from this office as to disposition of same.

III. The following telegram from general headquarters, is quoted for your guidance:

Sd four nine eight five period Vocational strength return has been discontinued period Orders will be issued shortly period Please notify all concerned period Ulio.

IV. *Discontinuance of use of lipo-vaccines.*—(1) The following circular from the office of the Surgeon General, United States Army, is published for the information and guidance of all concerned:

Circular Letter 134.

WAR DEPARTMENT,
OFFICE OF THE SURGEON GENERAL,
Washington, March 12, 1919.

Subject: Return to saline vaccines.

1. Beginning with date of receipt of this letter, saline triple typhoid vaccine and saline pneumococcus vaccine, types I, II, and III, will be used in place of the corresponding lipo-vaccine used to date.

2. Lipo-vaccines were adopted as a war measure on account of their obvious advantages and have served their purpose. The technique of manufacture, however, needs further improvement, and the duration of their protective power as compared with that of saline vaccines needs further investigation. Saline vaccines will, therefore, be used as a routine and lipo-vaccines will be reserved for emergencies.

3. All surplus lipo-vaccines will be returned to the Army Medical School, Washington, D. C., and to such place as may be directed in the American Expeditionary Forces.

4. Saline vaccines can be obtained by direct request to the commandant, Army Medical School, Washington, D. C., as heretofore.

By direction of the Surgeon General.

C. R. DARNALL,
Colonel, Medical Corps, United States Army,
Executive Officer.

2. In compliance with the above instructions all lipo-vaccine (triple typhoid and pneumococcus) manufactured in the United States will be reserved for emergency use. Saline vaccine will be used as a routine.

3. One carton from each batch number will be mailed to the commanding officer, central Medical Department laboratory, A. P. O. 721, for further study of its biological and immunological properties.

4. Adequate supplies of triple typhoid saline vaccines are expected in France at any moment and will be distributed immediately after arrival.

5. In connection with saline vaccines, the particular attention of all medical officers administering them is directed to the fact that it will be necessary to revert to the system of administering three doses at intervals of seven days, in accordance with instructions contained in Circular 16, Surgeon General's Office, 1916. Copy of instructions for administration will be found in each carton of the vaccines.

6. Because of the unanticipated delay in the arrival of vaccine from the United States, and the numerous changes in the location and strength of the various organizations of the American Expeditionary Forces, all pending requisitions for typhoid lipo-vaccine heretofore submitted under the provisions of Section II, General Order 31, general headquarters, A. E. F., 1919, are hereby canceled. The surgeon (senior medical officer) of each district, camp, post, or other independent command will make requisition for the necessary saline vaccine, syringes, and needles, requisitioning for an adequate number of syringes and needles for the men to be revaccinated. If adequate supplies of syringes and needles already are on hand, that fact will be noted on requisitions and these items will be omitted.

a. The senior medical officer on duty at the first replacement depot, St. Aignan Noyers, will be held responsible for the vaccination of all casualties passing through that depot and will make requisitions for adequate amounts of vaccine for distribution throughout the area.

b. The division surgeon of each division of combatant troops will make a consolidated requisition for all troops constituting his division and arrange for its distribution through the divisional medical supply officer. If the division is attached to an army, the consolidated requisition will be forwarded to the chief surgeon of the army. If under the orders of the Services of Supply, the consolidated requisition will be forwarded as indicated below.

c. Requisitions for all units, including divisions, in the American embarkation center will be forwarded to the chief surgeon of that center, who will authorize the issue of the necessary vaccine.

d. Except as indicated above, all requisitions will be sent to the director of the division of laboratories and infectious diseases, A. P. O. 721, Dijon, for visa, and forwarded by him to the appropriate distributing center for issue. In making requisitions, each unit comprising a command will be enumerated, giving exact designation and location of unit, actual number in that unit to be vaccinated, and American post office number.

e. Because of the scarcity of syringes and needles, the difficulty in getting a sufficiently large amount of the vaccine, and the necessity for preventing the requisitioning of vaccine for the same individuals or units by different medical officers, extreme caution is enjoined in making and forwarding these requisitions. A requisition will be forwarded until assured by direct inquiry of the next higher or subordinate medical officer that requisition for vaccine for the command has not been made.

(7) Special attention is invited to the absolute necessity for entering the exact status of the vaccination of each individual in the soldier's individual pay record book, and in the case of officers making a similar entry in the officer's record book of captains and lieutenants or furnishing them with a certificate. These entries must be made at the time the vaccine is administered. This information must include the date of vaccination and kind of vaccine used. If saline vaccine is administered, the date and whether first, second, or third dose.

(8) Strict compliance with instructions outlined above is enjoined. The foregoing instructions are not to be construed as requiring further revaccination with saline triple vaccine of any member of the American Expeditionary Forces who has been revaccinated with triple typhoid lipo-vaccine in France.

WALTER D. McCaw,
Brigadier General, Medical Department,
Chief Surgeon.

Circular No. 77:

AMERICAN EXPEDITIONARY FORCES,
CHIEF SURGEON'S OFFICE, SERVICES OF SUPPLY,
April 22, 1919.

Cases of typhus fever have recently been reported in France, and it is being reported constantly from central Europe.

Liberated people from Alsace-Lorraine and the Rhine Valley, and especially those who have been in Ukraine, Poland, and Russia, are the principal carriers of the disease. Allied prisoners returned from Germany are also special source of danger.

It is therefore necessary that medical officers in the American Expeditionary Forces be on the alert for the appearance of the disease among United States troops.

Typhus fever may show all gradations in severity, from mild cases to those of malignant type. The following is a brief summary of clinical evidence in a case of moderately severe typhus fever:

Prodromes are usually so light as not to attract attention or cause complaint. The individual may have a little "indigestion," headache, or weakness. He may look tired, feel a little dizzy and "achy."

The onset is abrupt. Severe chills and violent headache and pains in the back and limbs are the rule, while often profuse nosebleed and vomiting occur. The temperature rises rapidly to 102° or 103° F. The patient's face is flushed and his conjunctivæ injected. He feels very sick.

The eruption appears on the fourth or fifth day. It is rarely altogether lacking. It is often abundant and widespread. It appears first on the trunk—the armpits and shoulders—then on the abdomen and limbs.

The eruption is of two types, (1) a deep subcuticular mottling or marbling and (2) rose-colored spots about the size of a pinhead or somewhat larger. These spots at first disappear on pressure. In a few days many of them appear somewhat petechial and do not disappear under pressure. More rarely the ecchymotic character progresses to a distinctly purpuric appearance. The spots persist for 5 to 10 days.

The fever is sudden in onset, as has been stated, and continues high, with slight remissions, to terminate at the end of the second week by a defervescence during two or three days, sometimes by crisis.

Nervous and mental symptoms are prominent and may be present from the beginning, a mild or more active delirium, later coma-vigil, subsultus tendinum, prostration, and stupor are noted. The stuporous state of typhus is particularly characteristic.

The pulse rate follows the temperature. The beat is full and rapid at first; later it is small and feeble.

Respiratory tract: Bronchial catarrh is common. A dry cough at first is the rule. Later the expectoration is increased and may become profuse and even purulent.

Differential diagnosis, in the present situation, involves a consideration of typhoid fever, influenza, and measles.

(a) Typhoid fever shows a much more gradual onset. Injection of conjunctivæ is absent. The rash comes later, is less abundant, and the rose spots are rarely hemorrhagic; i. e., they disappear on pressure. The "typhoid state" comes later, and is more mild than in typhus. Prompt laboratory examinations will establish a positive diagnosis.

(b) Influenza includes so many clinical pictures that it must be considered here. It may be confused with typhus during the first three or four days. But the decline of the temperature in influenza after the third or fourth day and the absence of the rash will determine the diagnosis.

(c) Measles presents a rash that may be confused with that of typhus. But the prodromal coryza and the defervescence following the eruption distinguish it from typhus. The eruption is prominent on the face in measles; facial eruption is rare in typhus.

Laboratory diagnosis of typhus fever.—The Felix-Weil reaction is of value. This is an agglutination of *B. proteus* X-19 by the serum of a patient sick with typhus fever. *B. proteus* X-19 is not the cause of typhus fever. The reaction is therefore, not specific. But it has considerable diagnostic value.

Technique.—The bacterial emulsion should be prepared from a young agar culture (16 to 18 hours old). The emulsion should be freshly prepared; old emulsions do not agglutinate well.

The macroscopic method is used.

Serum dilutions from 1 to 100 to 1 to several thousands are used. (Typhoid patient's serum will agglutinate *B. proteus* X-19 at 1 to 25 or 1 to 50 in 10 per cent of cases.)

Time and temperature of the reaction.—Thirty-seven degrees centigrade for one hour, or room temperature 10° to 15° C. for two hours is used.

A rapid agglutination of *B. proteus* X-19 in a serum dilution of 1 to 100 or 1 to 200 in 30 minutes is of great value.

The agglutinins appear in the blood in typhus fever between the fourth and eighth days, reach their maximum titer (1 to 500 to 1 to 10,000) about the eleventh day, and decrease rapidly after the twentieth day. Agglutinins may be demonstrable in the blood of typhus convalescents as late as two months after recovery.

Cultures of *B. proteus* X-19 will be furnished on application to central Medical Department laboratory, A. P. O. 721.

Prophylaxis and sanitary control of typhus fever is based on the following facts:

(1) It is transmitted by the body louse (*Pediculus vestimenti*) and perhaps also by the head louse.

(2) The louse having bitten a typhus patient, does not become capable of transmitting the disease until nine days have elapsed.

(3) The incubation period of the disease—that is, the lapse of time between the infectious bite and the appearance of symptoms—is 6 to 10 days.

From these facts it follows that the most effective protection consists in careful delousing of all members of the American Expeditionary Forces.

The early diagnosis and discovery of all cases of the disease is an essential element in prophylaxis.

Mild or abortive cases, because they are likely to be overlooked, are a special source of danger. The possibility of the disease should be constantly borne in mind.

In the event of the occurrence of a case, the organization and quarters will be subjected to strict quarantine.

Men and their equipment will be deloused every third day.

Careful examinations of the individual men will be made daily.

Quarantine will not be lifted until 21 days after the discovery of the last case. A delousing of the men and their equipment and a disinfection of their quarters will be made on the last day of the quarantine.

The same measures will be applied to hospitals. A rigid quarantine of all personnel coming in contact with the case will be enforced.

WALTER D. McCaw,
Brigadier General, Medical Corps,
Chief Surgeon.

Circular No. 78.

AMERICAN EXPEDITIONARY FORCES,
CHIEF SURGEONS' OFFICE

April 25, 1919.

1. The following regulations will govern the investigation of cases of venereal disease and the control of venereal prophylaxis.

2. All cases of venereal diseases following failure to take prophylaxis will be investigated and the reason for the failure ascertained and recorded.

3. All cases of venereal disease which develop after having taken prophylaxis will be investigated and the cause of the failure of the treatment ascertained and recorded.

4. Medical officers, so far as possible, will collect all men at present in their charge who have had syphilis, and explain to them the course to pursue after demobilization in order to insure a complete cure.

5. All men who have had chancroids since enlistment will have Wassermann tests done before returning to the United States. If the blood is found positive, they will be retained

for one course of specific treatment. If the responsibility for this treatment being given on ship or in the United States will be assumed by the medical officer, the patient may be allowed to proceed with his resignation.

PROPHYLAXIS STATIONS

Attendants.—The attendants will be selected from among the best men in the organization. A noncommissioned officer will be in charge of each station. The men will be instructed on the following things:

- (a) The meaning and method of obtaining surgical cleanliness.
- (b) Simple facts about pathogenic micro-organisms, with special reference to those causing venereal disease. This instruction will include laboratory demonstrations of cocci, bacilli, and spirochetæ.
- (c) Simple descriptions of the anatomy and physiology of the male and female organs.
- (d) Descriptions of the ordinary symptoms and course of the three venereal diseases.
- (e) In the making of solutions of protargol and bichloride.
- (f) Method of prophylaxis and scientific reasons for each step.
- (g) Each section surgeon will form a central school at which all men having charge of the prophylactic stations will be trained.

(h) The importance of the work will be impressed on the attendants, and everything possible will be done to arouse their interest, pride, and a cooperative spirit in the work.

Technique.—The technique of administration of the prophylaxis will be on a par with that of a minor surgical procedure. Anything less than this will be faulty.

Stations.—Care will be exercised in the placing of stations; regard for privacy will be observed. At least one room will be given to the station, which will be painted white and made as inviting as possible. A waiting room for large stations is desirable. The general arrangement and cleanliness of the station will correspond to that of a modern surgical dispensary.

Running water will be installed wherever practicable. The most economical plan is to have several faucets arranged over a washing trough made of concrete or zinc; if available, porcelain sinks (individual) are preferred. When possible, individual booths will be made by the erection of partitions or curtains. Near each faucet will be a bottle of liquid soap with a split cork. Warm water will be provided if possible. When a water system is not at hand, running water will be supplied by means of an elevated galvanized-iron can to which a pipe or hose is connected. In temporary stations where basins will be used, a sufficient supply will always be on hand to insure the cleanliness of the individual basins.

Washing possesses the following advantages:

- (a) It has been shown that soap is germicidal for the spirochetæ pallida.
- (b) It removes mucoid substances and allows better penetration of the calomel ointment.
- (c) It opens minute wounds or cracks in which micro-organisms may have lodged and allows the calomel ointment to come in contact with them.
- (d) It mechanically removes a large portion of the organisms present.

Bichloride solution.—The washing with bichloride solution is essential and is necessary in connection with the washing with soap and water to destroy Ducrey's bacilli, since it has been shown that neither calomel ointment nor protargol solution is germicidal for this organism. The most satisfactory method for use of the bichloride is to have a large bottle, demijohn, or earthenware vessel holding not less than a gallon, with a rubber tube attached, placed on a wall bracket just above the trough. The bichloride solution will immediately follow the soap and water.

The following articles are the minimum requirements of a station:

1. A Primus oil stove for sterilization.
2. A stew pan or fish kettle with cover, for boiling.
3. A sterilizer for the sterilization of sponges. This may be made out of two tin buckets, one slightly larger than the other so that the larger may be inverted over the smaller. A rack of some kind is placed on the bottom of the inner bucket so as to hold the sponges or other articles above the water.

4. A long clamp for the removal of the sterile syringes, wooden spatulas, and sponges from their respective containers, thus avoiding the necessity of the patient putting his hands in these containers.

5. A sufficient number, never less than 12, of good workable syringes.

6. A closed receptable in which to keep the sterile syringes.

7. A number of wooden spatulas, which will be made by the attendant. These are for the removal of the ointment from the jar.

8. A closed glass receptable in which to keep the sterile wooden spatulas.

9. A glass jar or some kind of vessel for the sterile gauze sponges.

10. An adequate supply of wash basins, certainly not less than 10, if running water is not at hand.

11. Small glasses similar to ordinary medicine glasses in which protargol will be poured just prior to its being used.

12. A supply of gauze sponges.

13. One 8-ounce dark-colored bottle for the stock solution of protargol.

14. A supply of 30 per cent calomel ointment.

15. A supply of protargol or argyrol.

16. Some means of weighing or measuring the protargol so that small quantities of the solution may be made up, thus avoiding the necessity of using a whole ounce at one time.

17. A supply of bichloride tablets.

18. A small clock placed where the patient may see it.

19. A roll of paper.

20. A place for the patient to wash his hands.

21. A sufficient number of small towels 8 by 10 inches so that each patient may have a clean one.

Regulations.—1. The syringes will be sterilized by boiling and will be kept in a sterile vessel. Bichloride solution will not be used for this purpose.

2. The calomel ointment will be removed from the container by means of sterile spatulas.

3. Solution of protargol will be a uniform strength of 2 per cent, will be made fresh each week, and will be kept in a dark bottle. The date of making solution will be written on bottle.

4. Protargol solution will never be left standing in an open glass.

5. Basins will always be sterilized with bichloride solution after use.

6. The bichloride will have a uniform strength of 1 to 1,000.

7. Cake soap will not be used.

8. When prophylaxis is given to any soldier who is not a member of the organization to which the station belongs, a duplicate prophylactic record will be sent on the following day to the man's organization.

9. The data on the prophylactic cards will be transferred to a book which will be kept for permanent record.

Circular 79.

AMERICAN EXPEDITIONARY FORCES,
CHIEF SURGEON'S OFFICE,

May 9, 1919.

I. Disposition of medical supplies.—1. On receipt of an order by a medical unit to cease to function, such medical unit will pack up and prepare for shipment all of their hospital property and turn over such to the group or center medical supply officer prior to their departure. The personnel of a medical unit will not be relieved until this is done in a satisfactory manner.

2. The following instructions as to preparation of medical property, to be turned in to group medical supply depots, will be observed:

This property will be classified as follows:

(a) Articles that are new and have never been used.

(b) Articles that have been used but which are serviceable and fit for reissue.

(c) Articles that are unserviceable but which can be repaired at a cost not to exceed their value when so repaired.

(d) Articles which are not worth repairing but which are of value for the raw material of which they are composed.

After the above classification has been made, all property will be put up in compact and easily handled packages. One type of article only will be placed in the same package, and the number of articles in a package will be nearly as possible as commercially received. Whenever possible, baling, sacking, or crating should replace boxing, and except in case of large bulky articles contents should be in 5's or 6's, or multiples thereof. Fragile articles will not be packed loosely or without packing material. All enamel ware should be wrapped in paper or such material as will prevent chipping.

(a) Medicines will be carefully packed in boxes, with excelsior. Amount in boxes will be as follows:

- 1-quart in bottle, 12 bottles to box.
- 1-pint or pound bottles, 25 bottles to box.
- $\frac{1}{2}$ -pint or $\frac{1}{2}$ -pound bottles, 50 bottles to box.
- 3-ounce or smaller bottles, 100 bottles to box.

Attention is called to the instructions in Circular No. 68, III, that narcotics, morphine, cocaine, etc., must not be turned in to salvage depots, but must be sent to the nearest medical supply depot.

Save in exceptional cases, no more than 100 bottles of medicine will be packed in a case, and only one kind of medicine or size of bottles will be packed in a box. Mineral acids or inflammable or corrosive substances will be packed in sand or some noncombustible material and is preferably packed in small quantities.

(b) Tables, bedside, French, will be tied in bundles of 5.

(c) Tables, bedside, folding, American make, when crated will be in bundles of 10, and when not crated will be tied in bundles of 5.

(d) Chairs, folding, will be arranged as are folding bedside tables, American make.

(e) Bedsteads will be sorted as to kind and make and may be sent in unpacked.

(f) Mattresses will be sorted as to kind and make and where possible will be burlapped in bundles of 5.

(g) Bedding and linens will be arranged as indicated in Circular 72, chief surgeon's office, A. E. F., March 15, 1919, and section (b), paragraph 1, of that circular is modified as follows:

One sack (18 by 36 inches) will hold approximately as follows: 24 sheets, 20 pajama suits, 36 bath towels.

(h) X-ray apparatus as follows:

(1) All fluoroscopic and intensifying screens should be packed in a separate case, carefully protected from moisture and abrasion.

(2) All X-ray tubes in good condition for service should be shipped in the same form of container as received from the depot.

(3) Broken or punctured X-ray tubes should be broken and the metal parts wrapped up, labeled, and forwarded to the depot, where they will be taken up in place of the tube.

(4) Plates and films should be shipped in a separate container and properly labeled.

(5) Milliammeters should be removed from machine, excepting in the case of the bedside or the United States Army portable, and shipped in a separate box with excelsior or paper to protect them from injury.

(6) All small parts which might become loosened or lost in shipment should be tied or wired to the part to which they belong.

All property will be thoroughly cleaned before being turned in. Attention is invited to paragraphs 512 and 526, Manual of the Medical Department, 1919, and particularly to paragraph 524 relative to packing of typewriters.

All unserviceable articles will be turned in as salvage only. They will be properly listed in the order and in the nomenclature of the supply table and must have a certificate, with supporting affidavits if obtainable, stating whether condition was due to fair wear and tear in the service.

No supplies or property of any kind will be turned in to a group depot without first furnishing the medical supply officer with a list of such articles, with the approximate amounts of same, and making with that officer such arrangements as will prevent confusion in their

receipt. Duplicate loading lists will be sent with every truck load of supplies sent to local depot. One of these copies will be returned to consigner, signed by the receiving checker.

3. Group or center commanders will effect such cooperation on the part of the unit supply officer and the group or center medical supply officer as will aid and facilitate the work of the latter and will arrange for the detail of a sufficient force from the nonfunctioning units of his center as will be necessary for the final disposal of all medical property at such center.

4. Group or center medical supply officers and supply officers of independent medical units will be guided by instructions contained in paragraph 2 above, wherein they apply to the preparation of their own supplies for shipment, whenever orders are issued for discontinuance of such organizations and for the final disposal of their complete stocks.

II. *Correction.*—1. Attention is invited to Circular 78 (minimum requirements for prophylactic stations), item 21, which is changed to read as follows: "A sufficient number of small towels 8 or 10, so that each patient may have a clean one."

III. *Treatment of chancroids before embarkation.*—1. Due to inability to procure dark field microscopes and to the absence of specially trained medical officers in certain centers, many of the cases which were diagnosed as chancroid were either chancre or mixed infections. Recent careful examinations have shown that about 40 per cent of all sores occurring in the American Expeditionary Forces are syphilitic. In view of this it is requested that the attention of all organizations under your jurisdiction be directed to collect from all of their available records the names of all men who have had chancroid. All of these men who are available will be given an immediate Wassermann, and those found positive will be given one course of the standard treatment for syphilis. These cases will not be reported, as new cases, but each will be given a syphilitic register. Those preparing for embarkation will be given treatment provided there is time before sailing, but they will not be detained for it.

IV. *Nurses' records of assignment and pay.*—1. In reference to paragraph 8, Circular 52, this office, October 22, 1918, the attention of all concerned is invited to the fact that records of assignment and pay of nurses should accompany them on change of station and should not be mailed to this office. Strict compliance with these instructions is necessary in all cases to avoid delay in payment of nurses.

WALTER D. McCaw,
Brigadier General, Medical Department,
Chief Surgeon.

Circular No. 80.

AMERICAN EXPEDITIONARY FORCES,
CHIEF SURGEON'S OFFICE,
May 15, 1919.

I. *Discontinuance, central Medical Department laboratory and Army laboratory No. 1.*—(1) The central Medical Department laboratory, Dijon (Cote d'Or), and United States Army laboratory No. 1, Neufchateau (Vosges), will cease to operate May 15, 1919. After that date pathological, bacteriological, and serological examinations not possible of accomplishment with the facilities at hand will be made for such units as remain in the advance section and intermediate section, by the base laboratory, intermediate section, Tours. Therapeutic biological products, containers for specimens, and prepared culture media, formerly furnished by the two laboratories mentioned above, will be obtained, after May 15, from the nearest base laboratory still operating.

(2) Laboratory animals, agglutinating sera for diagnostic use, and amboceptor and antigen will be obtained from base laboratory, base section No. 5, Brest, by all Medical Department units in France, and in the instance of units in occupied territory in Luxembourg and Germany, from the Third Army laboratory, Coblenz, Germany.

(3) Bacteriological cultures for confirmation of diagnosis from Medical Department units serving in the Services of Supply, A. E. F., will hereafter be sent to base laboratory, base section No. 5, Brest, those from the Third Army to Coblenz, Germany.

(4) Pathological specimens, photographs, and other museum specimens will hereafter be carefully packed in compliance with the instructions in Circular No. 58, chief surgeon's office, A. E. F., December 2, 1918, and shipped direct to the Army Medical Museum, Seventh and B Streets SW., Washington, D. C.

(5) The office of the director of laboratories, Dijon (Cote d'Or), will be transferred to the office of the chief surgeon, A. E. F., Tours on June 1, 1919. All correspondence, requisitions, reports, and returns heretofore submitted to the office of the director of laboratories, Dijon (Cote d'Or), (A. P. O. No. 721) will, after June 1, be directed to the director of laboratories, chief surgeon's office, Tours (A. P. O. No. 717).

(6) Such provisions of Memorandum No. 21, office of the chief surgeon, division of laboratories and infectious diseases, September 18, 1918, as may conflict with the above provisions, are hereby rescinded.

II. *Reports of communicable diseases when closing hospital formations.*—1. In carrying out the final evacuation of patients, failure to report cases of communicable diseases which have developed in or have been admitted to the hospital within a few days prior to the evacuation is common. The confusion of the process of closing of a hospital is no excuse for the neglect of Section XII, Sick and Wounded Reports, which must be complied with promptly under all circumstances.

III. *Sale of unserviceable material and supplies.*—1. The following instructions have been received from the United States Liquidation Commission, War Department:

PARIS, May 8, 1919.

COMMANDING GENERAL, *Tours*:

Authority has been obtained from French Government for American Expeditionary Forces to sell in France unserviceable material and unserviceable supplies now on hand or such as may accumulate at the various stations throughout France.

The unserviceable material and unserviceable supplies are defined as junk, scrap material, unserviceable salvage material and supplies, and unserviceable property and material and supplies not worth transporting to depots.

These sales may be made under direction of the chiefs of the various services without reference to United States Liquidation Commission, War Department, for approval.

Please advise all services interested, but instruct them to make no sales in excess of authority granted herein.

Suggest necessary publicity be given to sales by advertising in newspapers where advisable and by handbills, posters, and circular advertisements.

KRAUTHOFF, G. S. A.

A-182.

By authority of United States Liquidation Commission, War Department.

2. Under the above authority, all unserviceable property and supplies, as well as material and supplies not worth transporting to depots, will be disposed of on the ground, after survey, under the provisions of paragraph 678, Army Regulations. It is desired that survey be instituted with a view of directing sale in compliance with the above instructions.

3. The proceeds of sales held under the above authority will be forwarded to the receiving finance officer, office of the general sales agent, Paris.

IV. *Authority to drop property issued from depots from returns.*—1. The following memorandum is quoted for guidance of all concerned:

AMERICAN EXPEDITIONARY FORCES,
HEADQUARTERS SERVICES OF SUPPLY,
FOURTH SECTION, GENERAL STAFF,
May 9, 1919.

1. Depot and other accountable officers who have shipped property to regulating stations for distribution to combat organizations, who have been unable to obtain a receipt from the regulating officer or the combat organization concerned, are authorized to drop this property from their returns, with a certificate that the property in question was duly shipped, and that it was impossible, due to the exigencies of the service, to obtain a proper receipt for the property. This certificate should be accompanied, when possible, by the ordre de transport covering the shipment of the property, or a true copy thereof.

2. Regulating officers have been instructed to return any invoices which they are unable to accomplish to the proper depot with all information they are able to give on the shipment in question.

By order of the commanding general:

J. C. RHEA, *Assistant Chief of Staff, G-4.*

WALTER D. McCaw,
Brigadier General, Medical Department,
Chief Surgeon

Circular No. 81.

AMERICAN EXPEDITIONARY FORCES,
CHIEF SURGEON'S OFFICE,
June 3, 1919.

I. The optical division, medical repair shop, in Paris, is closed and further prescriptions will not be filled.

II. *Venereal rate*.—1. The venereal rate has been rising for a month past and has now reached a point 25 per cent above its general average for several months. The attention of all medical officers is called to the fact that the Medical Department is held largely responsible for venereal rates, and that it has taken just pride in its work. There must be no relax action, and the greatest activity must be carried on to the very end. Every effort must be made to influence the enlisted men, to obtain the full and hearty cooperation of commanding and other officers, and of the military police and to maintain prophylactic stations at the highest point of efficiency. Put a good ending on a good work.

III. *Hospital funds*.—1. Hospital funds do not come under the provisions of General Order 77, general headquarters, May 10, 1919. They should be accounted for to the chief surgeon in the regular manner.

IV. *Promotions in American Expeditionary Forces*.—1. Medical officers are informed that no more promotions are being made in the American Expeditionary Forces, and it is therefore useless to continue to send recommendations to the chief surgeon's office. No action has been taken upon recommendations which reached this office after March 25, 1919.

V. *Property*.—1. Upon transfer to the French Government of movables pertaining to the Medical Department in any section of the American Expeditionary Forces under authority contained in letter from headquarters, Services of Supply, fourth section, general staff, dated May 27, to section commanders, a report will be made, before transfer is started, to the chief surgeon's office, attention supplies division, by the section surgeon; giving location of unit and in general terms, supplies and equipment to be turned over, such as: "25-bed infirmary, 100-bed camp hospital, etc." It is essential that this information be furnished as early as practicable in order that disposition may be given on any part of equipment which it may not be desired to turn over to the French. A record will be maintained in this office of all units transferred to the French Government in order to check same against bills for final payment; also to have data showing outstanding accounts. Section surgeons are advised that it is the desire of the Medical Department to dispose of as much movable property in every instance as the French will agree to take over on the ground without shipping same into depots.

WALTER D. McCaw,
Brigadier General, Medical Department,
Chief Surgeon.

Circular No. 82.

AMERICAN EXPEDITIONARY FORCES,
CHIEF SURGEON'S OFFICE,
June 6, 1919.

I. *Disposition of records*.—1. Confusion seems to exist in the minds of registrars of hospitals closing for return to the United States as to the disposition of clinical records of the Form 55 series and other similar records.

2. These will be carried with the unit to the United States, to be held until disposition by the Surgeon General's office.

3. The only retained records which will be accepted by the chief surgeon's office are Form 22, Form 52 (register card), and retained nominal check lists. Every unit closing its site permanently will, in compliance with Circular No. 61, chief surgeon's office, forward these records, together with final monthly report of sick and wounded, to the chief surgeon's office, in charge of the registrar and such personnel as are necessary to insure its prompt and safe delivery.

II. The following letter is quoted for your information and guidance:

1. The following telegram from general headquarters, dated May 19, 1919, repeated for your information and action necessary:

"Qualification cards of officers of staff corps have been delivered to the chiefs of services at headquarters Services of Supply, Tours. Cards for officers of divisions and corps, not a part of the Third Army, have been delivered to the personnel adjutant of their respective divisions and corps. Cards for officers on duty with base and intermediate sections, Services of Supply, not members of the staff corps, have been delivered to the personnel adjutants of these sections. In the future, requisitions for cards of officers returning to the United States will be made to the heads of staff corps departments instead of to the officers' qualification section, general headquarters. Authority for the execution of blank cards will be obtained from the head of the sections above indicated.

"DAVIS."

2. Hereafter application for the qualification cards of officers in the various staff corps, returning to the United States, will be made to the chief of the staff corps to which the officer belongs.

3. If an officer is transferred from any staff corps his card will be put in a sealed envelope and given to him to present to the proper officer at his new station.

By command of Major General Harbord.

L. H. BASH, *Adjutant General.*

WALTER D. McCaw,

*Brigadier General, Medical Department,
Chief Surgeon.*

Circular No. 83:

AMERICAN EXPEDITIONARY FORCES,
CHIEF SURGEON'S OFFICE,
June 16, 1919.

I. Circular Letter No. 223, office Surgeon General, is quoted herewith:

Subject: Record card, Form 627, A. G. O., enlisted men of staff corps and departments.

1. Attention is invited to paragraph 41, Manual for the Medical Department, which directs that:

"When a man is enlisted for, reenlisted in, or transferred to the Medical Department, the medical officer who first receives him will prepare and forward a record card of the soldier directly to the Surgeon General, except in the case of a man stationed in the Philippines, Hawaiian, or Panama Canal Department, when the card will be sent through the department surgeon." (As amended by C. M. M. D. No. 3, September 29, 1917.)

2. It is directed that in cases of those who have been enlisted for, reenlisted in, or transferred to the enlisted forces of the Medical Department since February 28, 1919, a record card be furnished this office and that in future paragraph 41 of the Manual for the Medical Department be strictly complied with.

II. *Sick and wounded reports.*—1. Attention of all commanding officers of medical detachments is again called to the American Expeditionary Forces requirements regarding sick and wounded reports. Any medical formation habitually hospitalizing for more than three days is required to render to the chief surgeon, A. E. F., a daily report of casualties and changes for patients in hospital (Form 22), and to make monthly report on field medical card and Forms 51 and 52. Infirmarys, small post hospitals, and other similar units will invariably comply with this when so hospitalizing, and will notify the chief surgeon's office, immediately by telegraph, that they are beginning to care for patients that, heretofore, would have been hospitalized in a larger formation.

2. Beginning with the report for July 3, weekly telegraphic report of sick and injured, Form 86, M. D., A. E. F., will be made direct to the office of the chief surgeon, A. E. F., instead of to the surgeons of first replacement depot, embarkation center, Le Mans, and district of Paris, and sections, Services of Supply. Great care will be exercised to see that the form checks before the telegram is sent. All units rendering reports mentioned in paragraph 1 are required to submit this weekly report. The above does not apply to units of the army of occupation, which will continue to report as heretofore through the surgeon of that army.

3. At the time of report for June 26, each surgeon of section Services of Supply and independent center will forward to the chief surgeon, A. E. F., a final list of units sending this report through his office, giving designation, location, strength, and complete "K" line for each unit so reporting.

III. *Method of closing accountability for medical supplies upon turnover to French authorities.* 1. Upon completion of turnover to the French authorities under the provisions of letter, headquarters, Services of Supply, fourth section, general staff, dated May 27, 1919, of property and supplies for which a medical property return is being rendered, an extra copy of the receipted inventory as furnished by the French and American representatives will be submitted with final return of medical property and constitute a voucher covering the entire accountability to be dropped. If it is impracticable to obtain an additional copy of this inventory signed by both representatives, a certified true copy of same will be furnished in lieu thereof.

WALTER D. McCaw,
Brigadier General, Medical Department,
Chief Surgeon.

Circular No. 84.

AMERICAN EXPEDITIONARY FORCES,
CHIEF SURGEON'S OFFICE,
July 1, 1919.

I. *Sale of property.*—1. Sales of unserviceable property as indicated in Section III, Circular 80, this office, May 15, 1919, is suspended. Due notice will be given when such sales may be resumed; and when such is done, the following instructions, contained in letter, commanding general A. E. F., Services of Supply, June 29, 1919, regarding the disposal of such supplies, will be observed:

In order to put a stop to practices which have obtained heretofore in the disposal of Government property, the following instructions will be communicated to all concerned and steps taken to see that the full intent of these instructions is complied with when sales are again authorized.

(a) No material will be sold under the heading of scrap or junk which ought not to be so classed.

(b) Property such as typewriters, wagons, motor vehicles, and miscellaneous machinery and equipment, which is not in immediate working order and can be so placed with little expense, will not be classed as scrap or junk. Such property and all property which can be rendered fit for good second-class sale with some slight repair will be cared for and property listed for sale.

(c) When sales are resumed, sales of any kind, including sales of junk, will not be made at stations where there are troops until or unless it is necessary to make such sales in order not to delay the departure of troops at that station, and then only sales of material which is really junk and beyond repair.

WALTER D. McCaw,
Brigadier General, Medical Department,
Chief Surgeon.

Circular No. 85:

AMERICAN EXPEDITIONARY FORCES,
CHIEF SURGEON'S OFFICE,
July 30, 1919.

The following revised instructions as to civilian laborers are published for the information and guidance of all concerned:

1. Laborers of the administrative labor companies are in all cases entitled to the same medical care and infirmary treatment awarded to United States troops. When hospitalization is necessary, agreement has been made with the French Government whereby French civilian laborers will be evacuated to French civilian hospitals.

2. In cases of emergency any laborer may be admitted to American Expeditionary Forces' hospitals, but as soon as practicable these cases should be evacuated.

3. Cases of venereal disease are to be evacuated to the hospital when necessary in the same way as other cases, but for this class of cases French hospitals shall be used exclusively.

4. By agreement with the French Government, the American Expeditionary Forces are not required to pay for care and subsistence for cases of venereal disease while in hospital.

5. Transportation of sick and injured laborers to and from hospital is furnished and provided for by section 1, paragraph 4, General Order 26 Services of Supply, as follows:

The transportation department will furnish the necessary transportation for all laborers who may be discharged, transferred, or leave by the termination of contract, upon the request of the commanding officer of the labor company to which the laborer belongs.

6. Subsistence for laborers in American Expeditionary Forces' hospitals is provided for by section 1, paragraph 8, General Order 26, Services of Supply, c. s., as follows:

When laborers employed under contract through the general purchasing agent are admitted to a United States military hospital, they will receive the same subsistence furnished United States troops. The Quartermaster Corps will reimburse the hospital fund at the rate prescribed in existing orders applicable when soldiers of United States Army are admitted to hospitals.

7. The surgeon on duty with the labor companies will have general supervision over the sanitary conditions of these companies, reporting upon same under paragraph 5, Form No. 2, M. D. L. B.

8. The surgeon, medical division, labor bureau, Army Service Corps, A. P. O. 717, should be notified at once by the surgeon attached to the labor company on Form No. 1, M. D. L. B., in all cases when laborer is—

- (1) Admitted to hospital,
- (2) Transferred to French hospital,
- (3) Dies, or
- (4) Suffers from any condition, though not necessitating admission to hospital, may have bearing on any future claims against the Government.

The same action will be taken in cases of emergency admissions to American Expeditionary Forces' hospitals or infirmaries by the commanding officers of the latter.

9. Diseases and injuries will be described in all reports in accordance with nomenclature prescribed in article 17, page 18, Sick and Wounded Reports for American Expeditionary Forces.

10. It is requested that special care be taken in reporting injuries, namely, giving definitely the nature of injury, manner incurred, and anatomical parts involved.

11. Form No. 2, M. D. L. B., will be submitted promptly each week, the week ending midnight Tuesday, and will embody all the data called for upon said report.

12. Whenever laborers are employed or discharged, the surgeon will make a thorough physical examination embraced under the following headings: "Height," "weight," "general examination," "head," "chest," "abdomen," "genital organs and anal region," "extremities." These reports should be forwarded promptly to chief of medical division, labor bureau.

13. Venereal disease is not necessarily a case for rejection, but all acute cases and every case that may make the individual a menace to his associates should be considered sufficient grounds for rejection. The presence of developmental and acquired abnormalities or defects, that in themselves are not sufficient cause for rejection, should always be noted on the physical examination report.

14. All reports and correspondence relating to civilian laborers by surgeons attached to labor companies will be made to the chief of the medical division, through the base surgeon.

By order of the chief surgeon:

L. MITCHELL,
Lieutenant Colonel, Medical Corps, United States Army,
Chief, Medical Division, Labor Bureau.

THE MORE IMPORTANT MEMORANDA PROMULGATED BY THE DIVISION OF LABORATORIES AND INFECTIOUS DISEASES, A. E. F.

From: The director of laboratories, A. E. F.

To: The division surgeon, — division.

Subject: Divisional laboratory unit.

1. The accompanying letter of information is intended to define the organization, equipment, and scope of work of the divisional laboratory.

2. The section of infectious diseases of this office has been organized for the instruction of divisional laboratory personnel and the advisory reinforcement of divisional facilities in the control and suppression of communicable disease. Paragraph 4 of the accompanying memorandum states the mechanism by which this reinforcement can be obtained when desired by division surgeons.

3. As the divisional laboratory personnel (mobile laboratories), in many instances, is not coming to France as an integral part of divisions, but arriving as casual units, division surgeons are experiencing some difficulty in locating this personnel.

In order to overcome this difficulty, the chief surgeon, A. E. F., has been requested to automatically order all these units to the central Medical Department laboratory for special instruction, to obtain equipment, and for assignment to divisions.

4. If your divisional laboratory personnel (1 medical officer, 1 Sanitary Corps officer, and 4 enlisted men) did not arrive as an integral part of your division, the personnel and equipment will be supplied by this office, as soon as available, on written or telegraphic request from you.

5. If your divisional laboratory personnel arrived with your division and has not received special instruction and equipment from the central Medical Department laboratory, it is requested that the names of the commissioned officers, two in number, be submitted to this office in order that we may request orders for them to proceed to the central Medical Department laboratory for temporary duty.

(Office letter 5-a (revised), division of laboratories and infectious diseases, July 7, 1918.)

OUTLINE OF ORGANIZATION AND ADMINISTRATION OF LABORATORY ACTIVITIES IN HOSPITAL CENTERS

1. In order that building space, equipment, and personnel may be conserved and at the same time that units comprising hospital centers may be given high-grade laboratory service, it has become necessary to pool the laboratory facilities of such units and to establish a base laboratory which shall serve equally all units comprising the center together with small subsidiary laboratories attached to each unit.

2. The plans of organization contemplate that all highly technical bacteriological, serological, pathological, and medical chemical work shall be done at the base laboratory of the center and that the small subsidiary laboratories shall be equipped for clinical pathological examinations only.

PERSONNEL

3. The allowance of personnel estimated for in the proposed revision of the Tables of Organization is 6 officers and 18 enlisted men. This is only an estimate, however, and the personnel may be increased, decreased, or distributed to meet local conditions.

4. Laboratory personnel, as outlined above, should be detailed by the commanding officer of the hospital center from the personnel of the units comprising that center. French women should be utilized as laboratory technicians wherever possible, thus releasing enlisted men for other duties. Requests for the employment of such women will be made to the chief surgeon, A. E. F., through the commanding officer of the hospital center and paragraph 3, General Order 13, headquarters A. E. F., July 13, 1917, compiled with.

5. The laboratory officer of a hospital center will be detached from his unit and attached to the staff of the commanding officer of the hospital center. All other laboratory personnel, commissioned and enlisted, will be attached to the laboratory service for professional duties only and be carried administratively on their unit returns.

DUTIES OF THE LABORATORY OFFICER, HOSPITAL CENTERS

- (a) In charge of base laboratory.
- (b) Responsible to the commanding officer of the hospital center in all matters relating to laboratory activities.
- (c) General supervision of the subsidiary laboratories.
- (d) Direct supervision and control of all laboratory personnel under the commanding officer of the hospital center.
- (e) Correlation of the activities of the laboratory service, both central and subsidiary, with those of the clinical service served.
- (f) Advisor to the medical supply officer of the center as to issue, distribution, and requisitioning of laboratory supplies for his center.

The name of one medical officer, well grounded in general bacteriology, will be submitted to the director of laboratories and infectious diseases, chief surgeon's office, A. P. O. 721, who will request orders for his transfer to the central Medical Department laboratory for a two-weeks' course of instruction in wound bacteriology.

SUPPLIES

6. All laboratory equipment now on hand at units comprising hospital centers will be pooled and turned over to the medical supply officer of the center and will be redistributed by him on memorandum receipt, after consultation with the laboratory officer, as the latter indicates. Inventories will be prepared showing all items that are not suited for use in the center (such as electric equipment not suited to the current available), together with items that are in excess of the actual needs, and forwarded directly to the office of the director of the division of laboratories and infectious diseases, office of the chief surgeon, A. P. O. 721, who will indicate the disposition to be made of such items.

7. All requisitions for supplies for the laboratory service will be prepared and forwarded by the medical supply officer of the center. Requisitions will be made in quadruplicate, one copy being retained and three copies forwarded. Requisitions for laboratory supplies only should be sent to the director of the division of laboratories and infectious diseases, office of the chief surgeon, A. P. O. 721, and it is desired that as far as possible requisitions be so timed as to permit shipment thereupon to be included in larger shipments made from supply depots on ordinary requisitions. These special requisitions should therefore be sent approximately ten days prior to larger requisitions contemplated and should bear notation that shipment should be held pending the receipt of requisition for general supplies.

8. Laboratory animals (sheep, rabbits, guinea pigs, and mice) will be purchased locally if possible, and if not, required for from the nearest army or base laboratory. In view of the great demand for laboratory animals in France by the Chemical Warfare Service, requisitions for such animals, especially mice, will be reduced to a minimum. Requisitions for white mice will be honored only in cases of great emergency and in small quantities. The Avery method or some other suitable technique as a substitute for the mouse method of pneumococcus type determination should be used.

9. Estimates have been prepared and orders are now being placed for standard items of laboratory equipment, and it is hoped that the laboratory equipment for hospital centers may be standardized in the near future. Until then, medical officers should be guided by the realization that technical apparatus of all sorts is obtained with great difficulty under present conditions and, that in view of the difficulties of transportation, all ordinary demands should be anticipated two or three months in advance.

10. An allotment of \$100 per month will, on request, be made by the chief surgeon's office to the medical supply officer of each hospital center to cover purchases of laboratory animals, milk, eggs, meat, and other ingredients of culture media and such other items as are necessary for the proper functioning of the base laboratory, and properly chargeable against Medical Department appropriations.

TRANSPORTATION

11. Transportation for central laboratories at base hospital centers has not been authorized as yet but this office has recommended that these laboratories be allowed one motor cycle with side car and one bicycle in the proposed revision of the tables of organization. (*Memorandum No. 8, division of laboratories and infectious diseases, July 23, 1918.*)

DIVISIONAL LABORATORY UNIT

1. In the organization of the laboratory service for the American Expeditionary Forces provision was made for a divisional laboratory unit to serve with each division.

The personnel, equipment, and proposed transportation for each unit is as follows:
Personnel:

- 1 Captain or First Lieutenant, Medical Corps or Medical Reserve Corps, Medical Department.
- 1 Captain or First Lieutenant Sanitary Corps, Medical Department.
- 4 enlisted men, Medical Department.

Equipment:

- Chest 1. Standard equipment for clinical pathology.
- Chest 2. Standard equipment for clinical pathology.
- Chest 3. Standard equipment for bacteriological incubator.

Transportation:

- 1 light truck ($\frac{3}{4}$ -ton Ford or other standard).
- 1 motor cycle with side car.

2. It is contemplated that these laboratory units shall constitute a part of the sanitary staff of the division surgeon and that they will be used by the divisional sanitary inspector in the investigation and control of communicable diseases and in the inspection, supervision, and control of sterilization of water supplies. While the question of immediate control of these units is a matter of internal administration, it is deemed advisable to place the medical officer in charge of the divisional laboratories because of the relative importance of the fields covered by the members of these units.

Some division surgeons have found it most practicable to attach the laboratory unit to the divisional sanitary train. When in divisional training or rest areas, it is contemplated that the laboratory unit will be attached to the camp hospital functioning for the division. At the front it is attached to an immobilized field hospital, preferably the one through which infectious diseases and medical cases are evacuated.

3. To properly perform its functions, it is contemplated that the medical officer and officer of the Sanitary Corps attached to this unit shall, on arrival in France, be sent to the central Medical Department laboratory for temporary duty for a brief course of instruction in the epidemiology of communicable diseases and supervision of water supplies respectively and to obtain their laboratory equipment. Further practical instruction will be given these officers by specially trained officers of the infectious diseases and water supply sections of this office, who will visit them from time to time for the purpose of giving aid in the solution of local problems.

4. When an epidemic disease prevails in a division in such proportions as to make it seem desirable to temporarily reinforce the divisional personnel and to have special epidemiological and laboratory studies made for the control of the disease, the division surgeon is authorized by Bulletin No. 32, general headquarters, A. E. F., to communicate directly with the director of laboratories and infectious diseases, who will dispatch special personnel and mobile equipment to reinforce the divisional authorities in controlling the epidemic. In the zone of the advance these units are usually located in close proximity to evacuation and mobile hospitals. These organizations are provided with a complete laboratory equipment, which is available for use by the members of the divisional laboratory units when highly technical laboratory examinations are required.

Many of the evacuation and mobile hospital laboratories are prepared to do Wassermann tests, and the officer in charge of the divisional laboratories should consult with the laboratory staff of the organization to determine whether demands for such examinations can be met.

5. The equipment to be supplied the divisional laboratory unit has been standardized and arranged in chests in order that it may be packed and moved at a moment's notice. Chest 1 (weight 230 pounds, dimensions 24 by 24 by 36 inches), chest 2 (weight 140 pounds, dimensions 21 by 24 by 30 inches), chest 3 (weight 180 pounds, dimensions 39 by 22 by 28 inches) constitute the divisional Laboratory equipment. Chests 1 and 2 contain the equipment and supplies for routine clinical pathology, while chest 3 contains a bacteriological incubator complete, arranged for heating with coal oil. The coal oil is to be secured from the divisional supply officer.

6. With the equipment mentioned above, the following classes of work can be done:

Sputum.—Microscopic examinations of smears for the tubercle, pneumococcus, influenza, and animal parasites.

Urine.—Appearances, color, odor, reaction, specific gravity, and qualitative tests for albumin, sugar, acetone, and diacetic acid. Microscopic examinations of urinary sediments. In suspected cases of typhoid fever about 10 c. c. of the urine should be sent to the central Medical Department laboratory or the nearest base or army laboratory in a bottle of bile medium, for isolation of the suspected microorganism.

Venereal lesions.—Microscopical examinations of smears for gonococci and Fontana stained preparations from venereal sores for spirochetes.

Blood.—Hemoglobin estimations (Tallquist), leucocyte counts, red-cell counts, and differential leucocyte counts. Microscopical examinations of stained preparations for pathological changes, plasmedia, etc. In every case of undetermined fever of over 48 hours' duration, 2 to 5 c. c. of blood should be collected in a bottle of bile medium and the culture sent to the general Medical Department laboratory or the nearest base or army laboratory for further study. Sera for agglutination tests, the Wassermann test, etc., should be collected in the serum capsules furnished with this equipment and sent to the nearest of the laboratories mentioned above.

Feces.—Microscopical examinations of fresh specimens for parasites, ova, blood, mucus, and pus cells.

In suspected cases of typhoid fever, paratyphoid fever, or dysentery, about a gram of the feces should be sent to the central Medical Department laboratory, or the nearest base or army laboratory, in a bottle of bile medium, for isolation of the specific microorganism.

Transudates and exudates.—Microscopical examinations of stained specimens for tubercle bacilli, gonococci, spirochetes, etc., and cytological changes.

Spinal fluid.—Microscopical examinations (cytologic and bacteriologic).

7. It is not intended that highly technical bacteriological and serological work shall be done by these units. In epidemics requiring epidemiological study and laboratory control, it is contemplated, as noted in paragraph 3 above, that special personnel and mobile equipment will be sent to reenforce the local authorities on request from the division surgeon.

8. It is not contemplated that the Sanitary Corps officer attached to this unit for supervision of water supplies shall do any extensive chemical or bacteriological laboratory work. In so far as his water work is concerned, it will usually be confined to sanitary surveys of sources of supply, recommendations concerning quality of water, and supervision and instruction of sanitary detachments in the detail of the sterilization of water by chlorination or otherwise. His work will be done under the supervision of the divisional sanitary inspector. Where bacteriological or chemical analyses are deemed advisable, the specimens will be collected by the water supply officer of the laboratory unit and forwarded to the nearest army or base laboratory or mobile water laboratory. A chlorine testing outfit for use in controlling the chlorination of water supplies will be issued to divisional laboratory units. Where extensive surveys requiring laboratory control are necessary, the Medical Department representative on the staff of the water supply officer for the army will be called on for assistance. He has under his control mobile water analysis laboratories designed to carry out such investigations.

9. Instructions for Sanitary Corps officer attached to divisional laboratory and for other officers concerned in the chlorination of drinking water.

(a) The official method of sterilizing water is by means of calcium hypochlorite. The powder is issued in 1-gram tubes. One tube is usually sufficient to sterilize one Lyster bag full of water. Break a tube of calcium hypochlorite into a clean ordnance cup, moisten the powder with a few drops of water, and mix into a smooth paste. Now fill the cup with water to within 1 inch of the top and mix thoroughly by stirring with clean spoon. Add this solution to a Lyster bag filled with clear water, stir thoroughly and allow to stand 30 minutes before using. After 30 minutes, test a cupful by adding 10 drops of a solution containing 10 per cent potassium iodide and 1 per cent soluble starch (supplied in laboratory equipment). The appearance of a blue color is indication that sufficient chlorine has been added to the water. If no color appears, the water is highly polluted and should be reported immediately to the medical officer having water supplies under his supervision.

(b) In emergency, when a Lyster bag is not available, the hypochlorite method can be applied to smaller containers of known volume, by calculations based on the knowledge that a Lyster bag contains about 36 gallons of water. Thus if a 10-gallon container is available one-quarter of the concentrated solution prepared in the ordnance cup as above can be added, etc. When smaller containers, such as 2-gallon tins, are used the original concentrated solution in the ordnance cup can be diluted by one-half, this dilution again diluted by one-half in another ordnance cup, and one-quarter of this second dilution added to the tin. By using a little ingenuity, the hypochlorite method can thus be applied to any container of known capacity.

(c) When tubes of calcium hypochlorite are not available and the powder is available in bulk, the following procedure should be adopted:

(1) An empty shell used in the Colt's .45 automatic pistol will hold 1-gram of powdered calcium hypochlorite when filled level with the top. Always use this empty shell as a measure. Add one shell full of powdered calcium hypochlorite to an ordnance cup and make a solution as described in paragraph (a), filling the cup with water to 1 inch from the top. Part of this solution is used in titrating the water to be sterilized, and the remainder is used for sterilizing the water.

(2) Rinse four ordnance cups with the water to be tested and fill all four cups to 1 inch from the top (500 c. c.) with the water to be tested. From a medicine dropper (to be obtained from regimental medical supplies) or pipette, add 4 drops of the calcium hypochlorite solution to the first cup, 8 drops to the second cup, 12 drops to the third cup, and 16 drops to the fourth cup. Mix the solutions in each cup thoroughly and allow the cups to stand 30 minutes.

NOTE.—Twenty drops delivered from a medicine dropper or a glass tube of 2 or 3 mm. bore is equal to 1 c. c.

(3) After 30 minutes, add 10 drops of potassium iodide-starch solution from a clean medicine dropper or pipette to each of the four cups and mix thoroughly. Some of the cups will show no color, some will show a blue color. The cup that contains the smallest amount of a hypochlorite solution capable of giving a blue color with the potassium iodide-starch solution contains the proportion of chlorine necessary to sterilize the water being tested. Thus, suppose the cup of water to which 8 drops (0.4 c. c.) of this hypochlorite solution was added gives a color with potassium iodide-starch solution, and the sample to which 4 drops (0.2 c. c.) of the solution was added gives no color. The cup to which 8 drops (0.4 c. c.) of the hypochlorite solution was added contains the right amount of chlorine to sterilize the water being tested.

(4) There are 36 gallons, or 288 pints, in the water bag when filled to the white mark on the inside. Since eight drops (0.4 c. c.) of the hypochlorite solution were sufficient to sterilize 1 pint, 115 c. c. of the same solution will be sufficient to sterilize the 288 pints in the Lyster bag. In practice, it is believed to be safer to use twice the amount indicated by the titration, so that in the example quoted 230 c. c. of the hypochlorite solution would actually be added to the water to be treated, or one-half of the concentrated solution, in the cup to which the 1 gram of calcium hypochlorite has been added, could be added to the water in one bag, and the solution prepared from the measure of hypochlorite would be sufficient to sterilize two bags of water.

(5) The following table shows the amounts of hypochlorite solution to add to a bag of water corresponding to the number of drops used in the titration:

	Number of drops							
	4	8	12	16	20	24	28	32
Amount of hypochlorite solution (cup measure).....	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2

NOTE.—In the titration, if the first series of drops do not show a blue color the water requires more than one measure of hypochlorite. The second series of drops will indicate the amount of a second measure of hypochlorite dissolved in a cup of water to be added to the bag in addition to the first cup.

10. In order that troops may be protected from the possibility of contaminated water, it has been ruled that all water not specifically designated as safe by the water-supply division of the Engineering Department shall be regarded as probably polluted and subjected to chlorination in Lyster bags. The ideal to be attained is that eventually no soldier with his unit shall drink untested or unchlorinated water. There are two obstacles not easily overcome, which render the attainment of this purpose difficult. These are chiefly the prevention of drinking at unapproved promiscuous sources, and the proper supervision of chlorination. The former difficulty is a matter of discipline in individual units. The latter can be accomplished only by the utilization of the proper personnel. In each division it is the duty of the Sanitary Corps laboratory officer to supervise the proper handling of Lyster bags and the chlorination of the water. Alone, however, he can not carry out this duty. No special personnel being available for this work, it is suggested that men be selected from the regimental sanitary detachments who can assist the sanitary laboratory officer in these duties. If, in each regimental sanitary detachment, one noncommissioned officer and two men could be assigned to the water service, these men could be instructed in the dosing and perhaps the testing of chlorinated water, under the guidance and supervision of the laboratory officer.

11. Expendable items of the laboratory equipment will be replenished from the central Medical Department laboratory, and spare parts of the nonexpendable equipment are carried in stock at the central Medical Department laboratory and will be supplied on requisition. All replenishment items should be requisitioned for by number as well as by name.

12. At the present time no transportation is provided for these units in Tables of Organization, and request has been made that one motor cycle with side car and one light truck ($\frac{3}{4}$ -ton Ford or other standard) be included in the revised tables of organization for this unit. The request has not as yet been approved.

(Memoranda 5 and 7, division of laboratories and infectious diseases, August 14, 1918.)

TECHNIQUE FOR THE "WASSERMANN TEST"

In order that the results of Wassermann tests made on members of the American Expeditionary Forces may be as nearly comparable as possible when different workers in different laboratories are performing the tests, and in consideration of the fact that tests on the serum of the same individual may not always be made in the same laboratory, it is necessary to adopt a uniformity of reagents and a standard method. Moreover, there are not many instances of any two men who use exactly the same methods for performing the test, unless their training in Wassermann work was obtained in the same laboratory. The principal differences have to do with the hemolytic system, the "antigen," the preliminary amboceptor or complement titration, and the total volume of the test. While every laboratory worker naturally feels that his method is either as good or perhaps better than some other, it is advisable that the various workers adapt themselves to the method herein prescribed. However, if there be any suggestions for improvement which will materially benefit the purpose, the director of laboratories will be pleased to receive them in written form and they will be given full consideration.

REAGENTS

"Antigen"; alcoholic extract of beef heart or calf heart, half saturated with cholestrin.

Hemolytic system: Anti-sheep (amboceptor, or sensitizer).

Complement, or alexin: Guinea-pig serum

"Antigen" and amboceptor will be prepared and standardized at the central Medical Department laboratory and furnished to laboratories where Wassermann tests are made. Monthly supplies will be forwarded without requisition, and additional supplies will be forwarded on special request by telephone, telegraph, or letter.

Arrangements have been made for each laboratory to be furnished with guinea-pigs and sheep.

STANDARD METHOD

The total volume of each test is 1.25 c. c., one-fourth that of the original Wassermann.

1. *Amboceptor, or sensitizer.*—The test is based on the "quarter-unit" amount; i. e., the amboceptor unit is that amount giving complete hemolysis of 0.25 c. c. of 5 per cent sheep cell suspension, in the presence of excess complement, after incubation in water bath at 37.5° C. for one hour. The amboceptor is furnished in glass ampules containing 0.1 c. c. inactivated anti-sheep serum. The dilution stated for any particular lot of serum represents the dilution in the titration containing the amount of serum determined as one unit. For example: It may be stated that a dilution of 1:3,000 is one unit, meaning that this dilution contains the amount of serum which is one unit. Two units are used in the test, so in preparing the reagent a dilution of 1:1,500 will be made; i. e., 0.1 c. c. of serum diluted with 149.9 c. c. of physiological saline will give a reagent each 0.25 c. c. of which represents two units of amboceptor.

2. *Complement, or alexin.*—Without entering into a controversy about the advisability of whether a preliminary complement or amboceptor titration be made, we feel that the variation in amboceptor is less than that of complement and that it is better to adjust the complement to a given unit of amboceptor.

Two or three guinea pigs should be bled the night before the day the test is done. The blood should be taken from the heart by means of dry sterile needle with syringe or suction apparatus and placed in a dry, sterile, conical centrifuge tube. After clotting has taken place, a stiff sterile wire should be run around the rim of the clot and the tube placed in an ice box until the following morning. The following morning the tube should be centrifuged and the clear serum drawn off. The serum is diluted 1 to 10 with physiological saline for use as complement. Each serum should be tested for hemolytic and complementary properties. For hemolytic properties, 0.5 c. c. of the dilution and 0.25 c. c. of 5 per cent suspension of cells should be incubated in the water bath at 37.5° C. for one hour. Providing each serum has good complementary properties and no hemolytic property, the sera should be cooled and diluted. In titrating for complementary properties the following protocol should be followed:

Protocol for complement titration

Tube	Guinea pig serum 1-10	Physiological saline	2 units amboceptor	5 per cent sheep cell suspension	Tube	Guinea pig serum 1-10	Physiological saline	2 units amboceptor	5 per cent sheep cell suspension
	C. c.	C. c.	C. c.	C. c.		C. c.	C. c.	C. c.	C. c.
1.....	0.15	0.60	0.25	0.25	6.....	0.10	0.65	0.25	0.25
2.....	.14	.61	.25	.25	7.....	.09	.66	.25	.25
3.....	.13	.62	.25	.25	8.....	.25	.75	.00	a. 25
4.....	.12	.63	.25	.25	9.....	.00	1.00	.00	b. 25
5.....	.11	.64	.25	.25	10.....	.00	.75	.25	c. 25

^a Complement control.

^b Saline control.

^c Amboceptor control.

The dose for the test is twice the amount in the tube, showing complete hemolysis after incubation in the water bath at 37.5° C. for one hour. With a good serum 0.1 c. c. will usually be this amount and 0.2 c. c. will be the dose for the test.

3. "*Antigen.*"—"Antigen" is adjusted so that 0.1 c. c. of an emulsion in physiological saline will be the dose for the test, the proper dilution will be stated with each lot. It is

very important that the "antigen" emulsion be prepared as follows: Place the amount of alcoholic extract to be emulsified in a flask, add physiological saline drop by drop, shaking the flask vigorously between drops, until at least 5 c. c. volume is obtained. The balance of the saline may be added in large amounts, the flask shaken well between each addition.

4. *The test.*—The amount of patient's serum (inactivated) used in each test is 0.05 c. c. In many instances there is sufficient natural and sheep hemolysis in human serum to produce hemolysis of one unit of cells with the amount of alexin or complement used in the test. On account of this, a unit of cell suspension, 0.25 c. c., is added to the test and allowed to incubate 15 minutes. At the end of this time complete or nearly complete hemolysis will have taken place in the control tube (back tube). It will not be necessary to add amboceptor to these tests. To all other tests, 0.25 c.c., representing two units of amboceptor are added to each tube.

First incubation period (for complement fixation), 1 hour.

Second incubation period (for natural hemolytic activity), 15 minutes.

Third incubation period (for hemolysis), 1 hour.

Too much emphasis can not be laid upon the necessity of controls for every reagent, and for their behavior with known negative and positive sera, before the actual test is set up.

The following protocol serves to illustrate the tests:

[Sera for controls: One serum; one serum; one serum; one (—) serum]

	Inacti- vated patient's serum	Antigen emulsion	Comple- ment	Physio- logical saline	5 per cent sheep cell sus- pension	Ambo- ceptor, 2 units, if neces- sary
Back tube.....	C. c. 0.05	C. c. 0.0	C. c. 0.2	C. c. 0.50	C. c. 0.25	C. c. 0.25
Front tube.....	.05	.1	.2	.40	.25	.25

Antigen controls

I	II
Known negative serum.....	C. c. 0.25
"Antigen" emulsion.....	.2
Complement.....	.2
Saline.....	.25
Incubate in water bath at 37.5° C. for 1 hour.	
5 per cent suspension sheep cells.....	.25
Incubate in water bath 15 minutes.	
Amboceptor, 2 units if necessary.	
Incubate in water bath 1 hour.	
	"Antigen" emulsion.....
	Complement.....
	Saline.....
	Incubate in water bath at 37.5° C. for 1 hour.
	5 per cent suspension sheep cells.....
	Amboceptor, 2 units.....
	Incubate in water bath, etc., for 1 hour.

Protocol for spinal fluid

Tube	1	2	3	4	5
Spinal fluid.....	C. c. 1.0	C. c. 1.0	C. c. 0.5	C. c. 0.25	C. c. 0.12
"Antigen".....	.0	.1	.1	.1	.1
Complement.....	.2	.2	.2	.2	.2
Saline.....	.0	.0	.0	.2	.25
Incubate in water bath at 37.5° C. for 1 hour.					
Amboceptor, 2 units.....	.25	.25	.25	.25	.25
5 per cent sheep cells.....	.25	.25	.25	.25	.25
Incubate in water bath at 37.5° C. for 1 hour					

Another important control which should be run in the regular test is one for serum specimens showing marked hemolysis when received.

Inactivated patient's serum.....	C. c. 0.05
5 per cent suspension sheep cells.....	.25
Saline.....	.95

The tinge of red imparted to the supernatant fluid will serve as a comparison for reading the result on that particular serum.

INTERPRETATION OF RESULTS

Four symbols will be used to designate results:

- + + (complete fixation).
- + (almost complete fixation).
- + - (partial fixation).
- (complete hemolysis).

Attention is directed to the necessity of having thoroughly clean glassware for serological work.

Reports should be made on Form 55q M. D.

(Memorandum No. 3 (revised), division of laboratories and infectious diseases, August 15, 1918.)

DIRECTIONS FOR USE OF APPARATUS FOR INTRAVENOUS INFUSION OF GUM-SALT SOLUTION

An outfit for the intravenous infusion of standard gum-salt solution is now available for issue and may be obtained for use in all places where gum-salt solution is used. It is the object in putting these sets out to enable the surgeon to use the solution directly from the original bottle and thus avoid an unnecessary transfer from one container to another. The articles composing this outfit are:

- 1 glass tube with curved end (long).
- 1 glass tube (short).
- 2 pieces rubber tubing.
- 1 rubber stopper (double-hole).
- 2 needles.

These outfits are furnished to facilitate the use of the gum-salt solution, and are to be considered as permanent property, which may be replaced only under the same conditions that other property is so replaced. The same care must be taken of these parts as of those of the transfusion sets. Great care must be exercised in the care of the needles, as they are scarce and hard to obtain. The use of the paraffin oil furnished with the transfusion sets is recommended for their care.

DIRECTIONS FOR USE

The tubing, stopper, and needle are to be sterilized in the usual manner. If a fine sediment exists at the bottom of the bottle containing the gum-salt solution, introduce the long glass tube carefully, so as not to disturb the sediment (assuring yourself that the opening in the curved end is above any sediment present). Then allow the solution to run out through the long tube to the needle by siphonage, or force the solution out by pressure from the bulb of a blood-pressure apparatus attached to the short tube. In case the solution has no sediment, the long rubber tubing with the needle attached can be connected with the short glass tube and the bottle inverted, so that the fluid flows into the vein by gravity.

The same precautions against introduction of air into the vein must be taken as in the case of blood transfusion.

A supply of these intravenous infusion outfits are available for issue to field, evacuation, mobile, and advanced base hospitals attached to the first Army, at army medical dumps Nos. 1 and 2. Requisitions from other units should be addressed to the commanding officer, central Medical Department laboratory, A. P. O. No. 721. The allotment for each hospital is 6 complete sets and requisitions must be limited to this number.

(Memorandum No. 18, division of laboratories and infectious diseases, September 9, 1918.)

FOOD AND NUTRITION SECTION INSPECTION DATA

1. The following information compiled from Appendix No. 4 of the Quartermaster's Manual, from the new Quartermaster's Inspection Manual, and from other sources, will be of value in connection with the examination of food supplies. Officers of the food and nutrition section should familiarize themselves with Appendix No. 4, Quartermaster's Manual, as well as with the information below. Quotation from new inspection manual:

It should be clearly understood that responsibility of final inspections, upon which depend acceptance or rejection of shipments, rests as heretofore entirely upon the officer in charge at the depot or camp where delivery is made.

2. *Sizes of cans now in use in United States supplies.*—

No. of can	Diam-eter	Height	Capacity	No. of can	Diam-eter	Height	Capacity
	Inches	Inches	Fluid ounces		Inches	Inches	Fluid ounces
1.....	2 $\frac{1}{4}$	4	11.6	3.....	4 $\frac{1}{4}$	4 $\frac{1}{8}$	35
1 tall.....	2 $\frac{1}{8}$	4 $\frac{1}{4}$	12.3	3.....	4 $\frac{1}{4}$	5	35.5
2.....	2 $\frac{3}{8}$	4 $\frac{1}{8}$	21.3	3.....	4 $\frac{1}{4}$	5 $\frac{1}{2}$	39
2 $\frac{1}{2}$	4	4 $\frac{1}{2}$	31.2	10.....	6 $\frac{1}{8}$	7	107

3. *Inspection of spoiled protein foods.*—In recent years there has been an increasing tendency to discount the idea of ptomaine poisoning from spoiled protein material. It is now the opinion of sanitary experts that the intestinal disorders that result from eating such spoiled material are usually due to infection from organisms swallowed with the material and not from organic poisons of the ptomaine character. As Rosenau puts it:

Meat poisoning is not a poisoning as that term is ordinarily understood, but almost always an infection; rarely an intoxication * * * many other foods, as milk, custards, vegetables, and even water may convey the responsible bacteria, which in the great majority of instances belong to the paratyphoid group.

Aside from the paratyphoid group, there is another type of meat poisoning comprised under the name botulism. The bacillus (*Bacillus botulinus*) generates a toxin as it grows in the meat or other protein media outside the body. Sausages readily become infected by this organism and are responsible for its name. When food infected by this organism is swallowed it is the toxin which produces the evil effects. Fortunately this toxin is killed by heat, if the heat is sufficient and penetrates through the mass.

In view of these facts and in the interest of protection of the health of the troops, the duty in regard to spoilage may be summarized under the following three heads:

(a) "Swells" among canned goods should be rejected; "springers" are also as a rule decomposed, but should be carefully inspected before condemnation. Meats that have a bad odor, after all possible trimming has been done, should be rejected as unfit for human food.

(b) Secure thorough cooking of all protein food to kill the micro-organisms and toxins of the botulism.

(c) Give especial attention to preventing the contamination of food after it is cooked, by flies, dirty hands, or any other agent which could plant in the material the disease-producing organisms.

4. *Quartermaster specifications which form the basis of food acceptance for the United States Army.*—(1) *Canned goods in general.*—In sampling take at least three samples from each case. Examine cans for rust; and if found, test spots thoroughly to make sure there are no perforations. Test bent places in the same way. To detect "springers," "knock" the can on a hard surface by striking the end forcibly. If the end springs out the can is improperly processed. This does not necessarily mean spoilage, but in the field such cans should be rejected as much as "swells," as there is neither time nor facility there for analysis. In reporting a faulty brand, give the percentage of spoilage. Also look for nail holes in the cans, which will cause spoilage without swelling.

(2) *Canned tomatoes, corn, and peas.*—To be sound and ripe, free from artificial coloring matter, packed without addition of water, tomato pulp, or juice. Goods guaranteed against

"spoils" and "swells" until July 1 following date of shipment. "Spoils" and "swells" to be held subject to seller's orders.

Net weight of No. 3 cans, not less than 2 pounds 1 ounce.

Net weight of No. 10 cans, not less than 6 pounds 7 ounces.

Net weight of No. 2½ cans, not less than 1 pound 12 ounces.

(3) *Canned fruits*.—Prime ripe fruit packed in either 20 or 30 per cent sirup. Orchard run after removal of culls. May have some blemishes. Canned fruits containing pits such as cherries, may swell and still be fit for food. Contents however, should be examined.

(4) *Canned vegetables*.—Field run of good stock. May be slight discoloration or breaking due to processing. Canned hominy may spoil without swelling the cans; if spoiled, is usually discolored and has a putrid odor.

(5) *Canned salmon*.—Pink, red, or medium-red salmon. Smell is the best test of unsound salmon. Meat should be firm, with no undue proportion of tips and tails. Packed in 1-pound or ½-pound cans. Bones cooked soft is indication of correct processing.

(6) *Canned sardines*.—Fish of uniform size and evenly packed. Not all sardines are eviscerated. Army now accepts regular Maine pack. Look out for indications of bellies burst by gas and the presence of red food. Oil must be free of rancid flavor, decay or odor. Very little or no added oil is a cause for rejection. Lack of or leakage of oil can always be determined by shaking the can. Contents will shake about in a solid mass. Net weights: Quarter cans run 3.6 to 3.8 ounces; key cans run 3.5 to 3.7 ounces.

(7) *Canned bacon*.—Examine condition of the bacon itself for sourness or rancidity. External examination of the containers is all that is necessary, as bacon is not processed. Vacuum drawn simply to facilitate packing. If container is defective, examine the bacon.

(8) *Canned lard*.—Steam rendered lard for issue. Examine labels. Beef or mutton tallow or vegetable oils, when present, are adulterants. Color should be white, surface smooth and not grainy. Flavor not scorched or burned.

(9) *Lard substitutes*.—Two sorts allowed: (1) Entirely of vegetable oils (refined cottonseed oil plus 10 to 15 per cent of vegetable stearine or by hydrogenating cottonseed oil); (2) cottonseed oil plus oleo stearine. Both must be firm, white in color, free from water and foreign material.

(10) *Meats (beef)*.—At the front or in the field in general the principal meat problem concerns care of frozen beef. Specifications do not concern us, because all of this beef is United States inspected before shipping. The minimum weight of the carcass is 450 pounds, from which should be deducted 3½ pounds from each hind quarter to compensate for the shank bone, left on for hanging. The difference in weight between a fore and a hind should not exceed 25 pounds the carcass. * * * Beef should always be inspected for the following qualities: (a) Its soundness; (b) its quality; (c) whether it has been properly trimmed; (d) whether it satisfies requirements with regard to weight; (e) whether the limitations as to sex (steers and spayed heifers only allowed) have been satisfied; (f) whether an equal number of fores and hinds is supplied; (g) whether it has been handled in a cleanly manner.

(11) *Hash, corned-beef*.—Consist of 50 per cent vegetables (potatoes and onions) and 50 per cent corned beef, seasoned with salt and pepper. If the cans when shaken seem to contain much liquid they should be considered as of suspicious quality and opened for further inspection.

(12) *Bacon*.—Inspect for soundness (10 per cent inspection considered sufficient). Surfaces free of mold, insects, skippers, rancidity, or sourness.

(13) *Flour*.—Made from sound wheat, free from smut, good color, best quality. When in doubt on this material send sample to office. Weevily condition can be determined by examination of the ears and seams of the bags. Worms also can be found on outside of bag if it is exposed to sunlight for awhile, but generally they are found in the flour; can be sifted out if not excessive,

(14) *Hard bread*.—Square crackers, flour and water only, thoroughly baked. Other forms which are made in France are also now supplied.

(15) *Baking powder*.—To be a tartrate phosphate, or alum powder from pure and dry ingredients. Yield not less than 12 per cent CO₂ gas.

(16) *Beans*.—Good beans are plump and firm under pressure. They should not dent when pressed with the thumb-nail. Should not exceed 20 per cent moisture. Should be

clean, of uniform size, and free from disease, especially anthracnose. Beans may be weevily or worm eaten. In either case they can be separated from sound beans by placing in water; unsound beans float readily and can be thus skimmed off, before cooking.

(17) *Rice*.—Good, clear, fresh milled, head rice. Should be semitransparent, free from grit, dust, or hulls, and presence of broken or dead white grains. Uniform-sized grains. Should also be free from seeds. Rice packed in sacks may get wet, and then cake and mold. If the sack is allowed to dry undisturbed, the moldy part can then be cut through and easily removed without contamination of the balance of the rice.

(18) *Potatoes*.—Texture firm when pressed by the hand, crisp when cut, and the cut halves when rubbed together briskly and then pressed together firmly should hold together. U. S. Grade No. 1, sound potatoes, practically free from dirt, foreign matter, frost injury, sunburn, second growth, cuts, scab, blight, dry rot, and damage caused by disease, insects, or mechanical means.

(19) *Onions*.—

Grade	Minimum diameter	Maximum diameter	Tolerance for defects		Additional tolerance for pink-yellow onions	Maturity	Brightness	Dirt or foreign matter	Shape	Variety
			Total	Decay						
	<i>Inches</i>	<i>Inches</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>					
U. S. No. 1.	2	None.	6	1	5	Must be	Must be	Free from	Well	One.
U. S. Boiler.	1	2	6	1	5	do	do	do	do	Do.
U. S. No. 2.	2	None.	10	2	(^a)	Need not be	Need not be	Need not be clean.	Any	Do.
U. S. No. 3.	1	None.	10	5	(^a)	do	do	do	do	May be mixed.

^a No limitation.

Onions of all grades, except for tolerance, must be sound, free from "doubles," "splits," "bottle necks," and seed stems and practically free from damage caused by moisture, sunburn, cuts, disease, and mechanical means. Sacks, ventilated barrels or crates called for.

(20) *Corn goods (hominy, hominy grits, corn meal)*.—The lowest grade of corn that can be used is No. 4. This grade shall be white corn, shall be sweet, shall contain not more than 19.5 per cent moisture, not more than 5 per cent foreign material and cracked corn, and not more than 8 per cent damaged corn, which may include not more than 0.5 per cent heat-damaged and mahogany kernels. Yellow No. 4 is same specification. Table hominy shall be degerminated hulled corn, thoroughly screened and dusted and shall contain not to exceed 1 per cent fat by ether extraction and not to exceed 14 per cent moisture. Grits shall be made from hominy screened and dusted clean, not over 14 per cent moisture or 1 per cent fat.

(21) *Standard meal*.—From entire grain, with 10 per cent food removed and 45 per cent feed meal extracted. Not over 11 per cent for export.

(22) *Dried fruits*.—Should be in good condition and free of insects and decay. Prunes, 50 to 60 per cent; peaches unpeeled. Dried fruits are attacked by weevils and molds. Figs are quite apt to be weevily in the center of the fruit, and while the worm is not often found the web is easily seen. They also mold, and at times both conditions are found. Dates will sour along the edges of the box, and unless promptly looked after sourness will penetrate the entire mass. Apples and peaches may be found moldy or weevily, or both. Prunes may sour and get wormy or moldy, but the moldlike white, sugary formation found on prunes at times is not ground for condemnation and can be readily removed by washing.

(23) *Coffee*.—Roasted and ground. Porto Rican, Hawaiian, or Central American preferred.

(24) *Milk*.—Unsweetened, evaporated, in 1-pound cans.

(25) *Vinegar*.—Cider, 4½ to 5 per cent acetic acid, in half barrels.

(26) *Pickles*.—Plain, uniform in size, about 40 to the gallon, thoroughly cured, free from nubs and soft stock, in half barrels. All soft pickles, in or out of vinegar, should be rejected.

(27) *Oleo*.—Must be uncolored, not less than 10 per cent butterfat and 2 ½ to 4 per cent salt. The coloration must be uniform, not streaked or blotchy. Odor and taste pleasant and resembling butter. Not rancid or sticky or grainy in the mouth. *Oleo* showing discoloration or dark patches on the sides or ends of the package should be cut into. Mold will usually penetrate the entire mass.

(28) *Sirup*.—Sugar cane, sorghum, or sugar sirup or blend, of same.

(29) *Flavoring extracts*.—Lemon, 5 per cent by volume of oil of lemon. Vanilla, 40 per cent by volume absolute ethyl alcohol and at least 2.5 percent true vanilla solids.

* * * * *

5. *The proper care of subsistence supplies*.—In inspection of storage of supplies attention is called to a few important facts to have in mind. In this connection, officers of this section should be familiar with sections 2729 to 2746 of Volume I of the Quartermaster's Manual; also with 2309 to 2313 of the same manual.

(1) *Care of beef*.—The care of frozen beef in camps is largely a question of treatment and ventilation. The following extract from Weekly Bulletin of Disease, No. 16, issued by the the chief surgeon's office, covers the practical points involved:

Whenever a quarter of beef is suspected of taint, first thoroughly wash the quarter with brine, examine the exposed surface, and if these are tainted cut off such portions as are affected. If the covered surfaces seem to be affected, have the butcher remove the covering tissue, taking care not to cut into the flesh. Do not condemn any part of the beef until these preliminary steps have been taken.

To determine whether decay has started within the beef, introduce a probe at the shoulder and hip joints; by the smell at the end of the probe you can determine whether the joints are affected or not. If they are affected, dissect out the bone and trim away the adjacent meat until a sound layer is reached. In no instance is it desirable or necessary to slash the quarter, the object being removal of affected parts with as little waste as possible.

To prevent flyblow, make sure that fly eggs are immediately washed off when the beef arrives. These are usually found on the shank.

The following methods are recommended for the best care of frozen beef:

It is better to hang beef in an airy, well-ventilated place, out of the direct rays of the sun, rather than to store it in damp, dugout refrigerators. Meat safes, covered with cheesecloth to exclude flies and with free access of air, will protect the beef for several days if it is wiped as frequently as moisture accumulates on the surface.

If it is necessary to retain cut-up beef for more than 24 hours, it may be placed in a container and covered with brine, but in cutting up beef require the butcher to first remove any tainted outer skin before he cuts into the meat; this avoids the carrying of the decayed portion into the sound meat.

In some places such safes can be constructed in the sides of the Adrian barracks; in others they have been erected in sheltered places out of the sun and near the kitchen. The cheesecloth that comes around the beef can be used to exclude flies. The main object is to keep the beef surface dry and with a free current of air passing over it.

(2) *Bacon*.—Excess of supply should not be allowed to accumulate. Note dates on packs and issue oldest bacon first. Keep dry and well ventilated, also cool. If in crates, should not as a rule be removed from them until used.

(3) *Canned meats*.—Should keep, if properly processed and stored, for many months. Should be kept dry to prevent rusting of containers. While freezing does not injure the contents, it is apt to spring seams through the swelling of the liquids.

(4) *Canned goods in general*.—All canned goods should be stored in a cool, dry place. Cold has no ill effect unless below freezing point, but freezing tends to bring about a separation of the contents and deterioration of quality. In camps, this sort of goods should be kept as far as possible from the range. Dampness causes rust, which in turn causes perforation. On this account see that they are not left in wet or damp boxes. Acid products should not be kept too long.

(5) *Beans, rice, etc.*—The greatest danger to these articles are weevils and moisture. Dry storage and good ventilation are essential, and they should never be placed directly on the ground. Also see to it that the old stock does not accumulate at the bottom of the bins. The same recommendations apply to flour, corn meal, hominy, etc.

(6) *Vegetables*.—Whenever possible these should be in slatted, well-ventilated bins. If it is necessary to keep in sacks, the materials should be often emptied out and sorted to remove

decayed or sprouted material. Potatoes should not be exposed to light any more than is necessary. They may be well stored in dugouts or pits, but not piled high. Onions should not be left in sacks or crates, but emptied out and spread as thinly as possible. They should not be put in pits, as they require air. Carrots and parsnips may be stored in pits and are not injured by slight freezing. The same is true of turnips.

(7) *Dried fruits*.—The best temperature is 34° to 36° F. It is important that they be protected from insect infection; also from moisture and other conditions that will produce rotting or moldiness.

(8) *Coffee*.—Requires dry, well-ventilated storage. Should not be kept near pepper, tobacco, or other things from which it can absorb odors, and containers should be kept tightly covered at all times.

(9) *Lard and butter*.—Keep cool. Melting and rehardening favors rancidity.

(10) *Protection from rats*.—All goods like flours and meals are often protected from rats if old newspapers are placed between the sacks. The rats use these to make nests of and spare the other materials.

(11). It seems to be an established fact that practically all bread mold can be traced to delayed shipment or unsuitable storage. The bread is a culture medium for mold, requiring merely favorable conditions for its development. Any treatment that makes conditions unfavorable to mold growth represents an optimum treatment for bread. Obviously this means good ventilation, freedom from moisture, the prevention of accumulation of old material, daily cleaning of bread boxes, and the like.

(12). Section 2745, Quartermaster's Manual, gives the insects that are injurious to subsistence supplies and their habits. The lowest and highest temperatures to which certain perishable goods may be subject without injury under the conditions stated are given in the following table:

Perishable goods	Lowest outside temperature, unprotected	Temperature above which injury occurs	Perishable goods	Lowest outside temperature, unprotected	Temperature above which injury occurs
	° F.	° F.		° F.	° F.
Cabbage.....	25	75	Pickles.....	22	
Cheese.....	30	75	Potatoes.....	33	80
Extracts, flavoring.....	20		Rice.....	20	90
Fish, canned.....	18		Tomatoes, canned.....	26	
Grapes.....	34		Vinegar.....	22	
Onions.....	20				

6. Members of this section have been familiar for some time with the value of the garbage pail as a basis for diagnosis of mess troubles. With the garrison ration, a secondary and almost equally important place for this purpose is the storeroom. Learn to know the bearing of each article there on the daily menu. If you find excess sugar it means no desserts are being made. Excess flour, the same thing. Lack of fruits or baking powder means a definite reduction in menu possibilities, etc. This correlation between storage and menu possibilities should be a special study of every inspecting officer.

7. *A few waste statistics*.—(a) Potato peeling: Refuse and waste as ordinarily peeled, 25 per cent; as carefully peeled, 13 per cent; by machine and eyes removed by hand, 12 per cent; peeled by machine, 4.5 per cent; unnecessary waste as ordinarily peeled, 12 per cent.

Ration (80 per cent of 20 ounces) is 16 ounces \times 1,750,000 men = 1,750,000 pounds; 12 per cent waste = 210,000 pounds of food for that number of men for 1 day.

Potatoes also supply 55 per cent of all the basic ash in the ration; 12 per cent waste reduces this markedly and increases the acidity of the ration.

(b) Value of beef ration per day for 1,500,000 men is \$294,999 in the market at home, without adding the cost of transportation. In one shipment of 25,000 pounds of beef nearly 75 per cent was salvaged by trimming at the station, though the whole had been condemned in the field.

8. *Methods of survey and condemnation.*—Paragraph 2311, Quartermaster's Manual:

Before shipping subsistence supplies to other points, quartermasters will carefully examine the supplies, opening original packages when there is a doubt as to the sound and serviceable condition of their contents. Damaged or unserviceable articles, or those liable soon to become so, will not be shipped.

This article supplies sufficient authority to prevent depot quartermasters from sending out goods which you find defective, and can be used by you for this purpose.

Paragraph 2787:

If the stores have not deteriorated so as to render them unfit for human consumption, and are not required in the military service, they will be sold at auction.

If the stores have deteriorated to the extent of rendering them unfit for human consumption but are of value for other purposes, they will be sold at auction, and prior to the sale the accountable officer will cause each can, box, bottle, or other container to be stamped or indelibly marked as follows: "Deteriorated military supplies condemned and sold under section 1241, Revised Statutes."

If the stores have deteriorated to such an extent that they are without value for any purpose whatever, they will be destroyed. (Cir. 89, M. D. 1908.) Such stores must be acted on by an inspector or survey officer before being disposed of.

The last sentence of this article calls attention to the necessity of a board survey. In practice, the following methods are used: (a) When meats are to be condemned: As soon as possible after their receipt the commanding officer summons a board of medical inspectors. They may call on a quartermaster meat inspector to aid them, especially to save any part of the carcass fit for consumption. Whatever they condemn, in whole or in part, the quartermaster credits the company for the amount destroyed. In such a case a field officer with his butcher should first ask for the cooperation of a sanitary inspector and take action with a view to saving as much as possible.

(b) Subsistence stores: Canned goods or spoiled goods generally are usually returned to the commissaries by the mess or supply sergeants for exchange or credit. If the quartermaster refuses to accept these articles, the sergeant should report the matter to the mess officer and through him to the commanding officer, who may call a medical board to pass upon the food. It must be remembered (par. 2322): "After rations leave the quartermaster they are in the keeping of the troops, and any loss sustained by subsequent deterioration or avoidable circumstances is theirs." In other words, the quartermaster is justified in refusing to receive back goods accepted by the sergeants, unless they are acted upon by a surveying officer. He may, however, accept *prima facie* evidence. If he refuses to accept it, the survey board is the only resource of the company.

There are several articles of the Quartermaster's Manual which should be familiar to all our officers. See paragraphs 2309-2313, also 2769-2853. The methods of appointing a surveying officer and his responsibility and method of procedure are covered by paragraphs 710-726 of the Army Regulations, 1913, corrected to April, 1917. Of these articles, 711 covers appointment; 712, his duties; 715, scope of action; 716, his report; and 717 (2), the character of supplies that may be destroyed and the amounts.

In the American Expeditionary Forces there is usually to be found associated with large camps some officer of the salvage service with whom you should get in touch. If none such exists, locate the nearest one and determine what is his relation to your unit. Secure his cooperation in the matter of disposal of condemned goods.

Please report to this office the names of manufacturers and brands of goods which are found to be markedly defective, in order that we may report the same to the chief quartermaster.

The following circular indicates the attitude of the Quartermaster General in regard to disposal of canned foods. It will be noted that this is addressed to the depot quartermaster at New York and applies strictly to conditions in the States. It may be useful, however, for quotation in troublesome cases.

Acting Quartermaster General, May 24, 1918, to depot quartermaster, New York, N. Y.—Disposal of canned foods when containers are of questionable appearance:

1. Some of the containers of canned vegetables, fruits, meat and meat-food products, and other canned goods, delivered to the Army, do not show proper vacuum. The food in such containers may or may not be sound.

2. The contents of these cans, known as "swells" and "leakers," are unsound because of fermentation or putrefaction. The contents of other cans, commonly known as "springers" and "flippers" (those showing loose tin or insufficient vacuum), and overfilled cans usually are found to be sound.

3. To distinguish between these two classes of canned foods, the containers of which have a questionable appearance, requires expert knowledge. It is impracticable to provide special inspectors having expert knowledge of canned foods for the examination of those products at all camps, especially at those where only a few troops are stationed. For this reason canned foods should not be issued to troops unless the containers are in perfect condition and show a good vacuum. Inexperienced persons should not attempt to differentiate between questionable cans, the contents of which may be sound or unsound, but should reject all those packages which are not in perfect condition.

4. The term "good vacuum" means the ends of round cans, large sides of flat cans, and the sides and ends of high four-sided cans should be tightly drawn and should neither show tin nor distention.

5. All canned foods, the containers of which are not in perfect condition, should be held for reclamation. "Swells," "springers," "flippers," "overdefects," should all be included in this class. Immediately after the discovery of canned foods showing any one of these conditions, the facts should be reported to the depot or purchasing quartermaster, in order that arrangements may be made with the contractor to replace the rejected products. (See pars. 809 and 2310, Manual for the Quartermaster Corps.)

By authority of the Acting Quartermaster General:

J. W. McINTOSH,
Lieutenant Colonel, Quartermaster Corps, N. A.,
Subsistence Division.

9. *Requests.*—We are anxious to secure a series of recipes based on practical handling of dried vegetables. Please collect such data and mail as fast as accumulated to this office, that we may publish them for the benefit of all officers.

Also continue to send in recipes which have been found of value and which utilize the components of the garrison ration.

In case your division has special experiences such as troop movement or combat experience, send us all the information you can gather as to the efficiency of the ration under these conditions.

(Memorandum No. 22, division of laboratories and infectious diseases, September 10, 1918.)

PROPHYLACTIC SERUM TREATMENT AGAINST GAS GANGRENE

A test of the prophylactic value of anti-gas-gangrene sera in the human subject is about to be made.

The first serum to be used will be one which protects in the animal experiment against the toxins of both the tetanus bacillus and the *Bacillus perfringens* (B. Welchii). While the experience of French and British investigators indicates that gas gangrene may be caused by a variety of anaerobic organisms acting alone or conjointly, the high percentage incidence of perfringens infections justifies the thorough trial of the univalent anti-gas-gangrene serum now available in amounts sufficient to conduct such experiments on a large scale.

Polyvalent sera capable of neutralizing the toxins of other anaerobic bacteria concerned in the causation of this condition are now in the process of preparation and will be made the subject of a similar trial where available in adequate amounts. It is proposed to use in every instance sera which protect against the toxin of the tetanus bacillus as well as the toxin of one or more anaerobic bacteria to avoid the necessity of giving several injections, in some instances sera derived from horses immunized against the toxins of two or more pathogenic anaerobes will be employed. In others, the pooled sera derived from several horses each immunized against the toxins of a single anaerobic bacillus will be used. For the present it is our intention to confine the trial to antitoxic sera. Bacteriolytic and combined bacteriolytic and antitoxic sera have been prepared by several French authorities and are now being put to a practical test. The results of these experiments will determine whether similar tests will be undertaken by the medical staff of the American Expeditionary Forces.

To secure reliable results the complete cooperation of all medical officers concerned with the care of the wounded and all laboratory officers taking part in the examination of

these cases is absolutely essential. The development of gas gangrene in patients who have received the prophylactic injections of anti-gas-gangrene serum can not be accepted as evidence against its value unless it is established that the only pathogenic anaerobe present in the case is the microorganism against which the particular antiserum is supposed to protect. In view of the fact, as indicated above, that several anaerobes may be responsible for the condition under consideration, and in view of the further fact that the detection and the recovery of some of the less common pathogenic anaerobes presents many difficulties, it is only by the exercise of the greatest care on the part of the examining bacteriologist that false interpretations can be avoided. Apart from the study of the anaerobes found, special attention should be paid to the *Streptococcus hemolyticus* owing to the important part which this organism appears to play in favoring the development of the gas gangrene.

To avoid errors, it is proposed to adopt the following precautions:

1. Every case in which the records show that anti-gas-gangrene serum has been administered as a prophylactic measure should be reported to the bacteriologist the moment symptoms of gas gangrene develop, and all cases in which from the nature of the injury or the condition of the wounds such an occurrence might be expected should also be reported so that they may be made the subject of a detailed clinical and bacteriological study even before the symptoms of this disease have developed.

2. In all such cases the bacteriologist should make every effort to isolate in pure cultures all of the anaerobic bacteria present. Such strains should be sent under proper conditions (preferably by courier) to the central Medical Department laboratory for verification of the diagnosis.

3. In addition the original cultivations in cases of gas gangrene should be made in duplicate. One set should be sealed and sent to the central Medical Department laboratory by courier after 24 hours incubation, and the name, number, rank, and organization of the patient and the diagnosis of the case. In view of the good results secured in this laboratory by the use of liver peptone water medium it is recommended that this medium be employed in place of the standard veal or beef broth. The liver peptone water is prepared as follows: Peptone, 10 gr.; sodium chloride, 5 gr.; water, 1,000 c. c.

Boil 30 minutes; neutralize to phenolphthalein, then add 20 c. c. of normal sodium hydrate solution; autoclave for 15 minutes at 115° C.; filter; tube (10 c. c. in each tube) and add approximately 1 gr. of rabbit, beef, or human liver. Autoclave for 15 minutes at 115° C.; incubate for 3 days to insure sterility (if sterile, fluid will remain clear; it may assume a faint yellow color).

Owing to the importance of determining the exact nature of the infection in cases receiving prophylactic injections of the anti-gas-gangrene serum these double checks seem necessary. A report of the findings will be transmitted to the bacteriologist submitting the specimens to the laboratory.

4. In all cases of death of individuals who have received prophylactic injections of anti-gas-gangrene serum, excepting when the cause of death is obviously due solely to the injury and the fatal issue occurs very soon after the injury, a complete autopsy should be performed and detailed bacteriological examination of the blood and internal organs be undertaken to exclude the possibility of death from causes other than a gas bacillus infection.

Method of injecting the serum.—Intramuscular injections should be made in every instance. Concerning the most favorable site for these injections opinions differ. Some French investigators claim that the injection should be given in the neighborhood of the wound. Since this method may have some advantages over the injection of the serum in distant parts, it is recommended that when possible the serum be introduced into the extremity in cases where the most serious wound involves one of the limbs. These injections should be administered on the proximal side of the wound. In all other instances, and where the pressure of work precludes the selection of a particular site, the injection should be given in the region recommended for the administration of tetanus antitoxin. The injections of tetanus antitoxins in the cases that are to serve as controls should also be administered intramuscularly.

Cases that are to receive prophylactic injections.—The original trials will be confined to the wounded of a single division. To secure results of value the recipients will be selected at random. Approximately one-half of the wounded arriving on a given day will receive

injections of a combined tetanus and anti-gas-gangrene serum, while the remainder will receive usual injections of tetanus antitoxin and will serve as controls. Both the treated and the untreated cases should receive the anti-gas-gangrene card referred to below.

It seems necessary to select the controls from the same division and from the same group of wounded, in view of the fact that the incidence of this complication (gas gangrene) is determined by a number of factors which may vary from day to day. Weather conditions, the character of the soil over which the fighting occurs, and the character of the missiles employed all may have a determining influence on the incidence of gas gangrene among the wounded.

Records.—For this experiment special antigas-gangrene record cards will be provided. The front face of this card concerns solely the officer administering the anti-gas-gangrene serum and the officer who has charge of the controls. These officers should fill in all of the dates called for on the front face of this card. The back of the card concerns only the medical officers in the evacuation, mobile, and base hospitals. The officers belonging to these organizations should fill in the data called for on the back of this card. All cases showing evidence of gas gangrene at the time the operation is performed or in which the nature of the injury or the condition of the wound suggest the probability of such an occurrence should be reported as already indicated to the laboratory officer, who will begin his bacteriological investigations immediately, if such are indicated, and also begin the collection of all clinical data called for on the standard bacteriological report card, Form No. 3, and all other data which in his opinion may be of interest in the particular case under consideration. When the patient is to be evacuated immediately and the time for bacteriological investigations is not available, it is important that the clinical data be gathered and transmitted with the patient to the hospital organization to which he is sent.

The control cases should also be made the subject of a special study, but only if time and the personnel available permit. Apart from establishing beyond a doubt the occurrence of a gas-gangrene infection in these cases, the results secured in connection with these controls have no bearing on the interpretation of the results of the present experiment.

The gas-gangrene card and a copy of all other laboratory records should accompany the patient. This applies to the recipients of the prophylactic injections as well as to the controls. After death, or as soon as the danger of the development of gas gangrene in convalescents has subsided, these cards and all other laboratory records should be sent to the director of laboratories, American Expeditionary Forces, A. P. O. No. 721.

(Memorandum No. 24, division of laboratories and infectious diseases, October 16, 1918.)

ORGANIZATION OF LABORATORY SERVICE IN HOSPITAL CENTERS

1. The following outline of the organization of the laboratory service in a hospital center has been worked out tentatively in the hospital center at Nantes and is submitted for your information.

2. It is requested that the chief laboratory officer submit to this office a similar statement concerning the arrangement of the laboratory service in his particular center.

OUTLINE OF LABORATORY ACTIVITIES IN HOSPITAL CENTER, NANTES

Clinical microscopy.—All routine work, as urinary analysis, blood counts, sputum for tuberculosis examination of warm stools for amœba, and blood cultures, is to be carried on in the subsidiary laboratories.

Wound bacteriology.—(a) *Aerobes:* A portion of the material to be examined is first smeared on a slide made sterile by heat, a Gram stain made, and the morphology of the organism and bacterial count noted on the bacteriologic record card. If streptococcus is present, inoculate a portion of the material on agar slant and agar¹ plate. In inoculating plates, a portion of the material is placed in one corner and streaked out on plate with a platinum spatula.

To reduce as far as possible the duplication of work in the subsidiary and central laboratories, the isolated colonies on plates are to be picked, using the original Gram stain as a guide for the different organisms to be sought for, subcultured on plain broth if it is a bacillus, and sent to the central laboratory with the bacteriologic record card for identification. On the other hand, if a staphylococcus is present, the organism is not isolated and sent to the central laboratory, but held for type determination in the subsidiary laboratory, and recorded on the bacteriologic record card.

¹ Blood.

Should the isolation be unsuccessful from the first inoculation, and the time is pressing the original agar slant, and if advisable the original agar plate, are to be sent without delay to the central laboratory. In each case note carefully the results of all previous work done.

(b) *Anaerobes*: For anaerobic cultures, the officer in charge of the subsidiary laboratory is to take the material from the wound to be examined with a Pasteur pipette. After sufficient material is secured, the contents are expelled into a sterile test tube. The pipette is secured in the test tube with a cotton stopper and sent to the central laboratory, wrapped in a bacteriologic record card, or Form 55u.

The subsidiary laboratory is to retain at all times the Form 55u so that preliminary reports can be recorded. On completion of identification, the bacteriologic record card will be sent back to the subsidiary laboratory, where two extra copies will be made; one is to be sent at the end of the month to the central laboratory, the other is to be attached to the clinical brief, while the original copy is to be filed in the subsidiary laboratory for reference.

The same procedure holds true for aerobic identification.

Every effort should be made to secure anaerobic specimens in the forenoon as it will facilitate the distribution of the day's work in the central laboratory.

Miscellaneous examinations.—All specimens are to be sent through the subsidiary laboratories to the central laboratory.

(a) *Stool cultures*: This work is to be done in the central laboratory. Special specimen bottles are to be used.

(b) *Sputum for pneumococcus typing*: Sputum from the deep air passages is collected in a sterile Petri dish and sent immediately to the central laboratory.

(c) *Throats cultured for diphtheria*: Where one or more wards are to be cultured the swabs are taken and sent to the central laboratory for diagnosis. However, if there are only a few cultures to be made, the diagnosis can be made in the subsidiary laboratory.

(d) *Urethral smears*: These are to be reported on in the subsidiary laboratories.

(e) *Chancre and chancroids*: These examinations are to be made in the subsidiary laboratories.

(f) *Water analysis*: This is to be carried out in the central laboratory.

(g) *Wassermanns*: These are to be done in the central laboratory. The blood is to be sent to the central laboratory before 5 p. m. on Monday and Thursday, with Forms 55u (in duplicate) and 97.

(h) *Pleural and spinal fluids*: These are to be examined in the subsidiary laboratories.

(i) *Carriers for meningococcus*: Blood plates are to be inoculated and incubated overnight in the subsidiary laboratory. The plates are then sent to the central laboratory, with Form 55u.

(j) *Surgical pathology*: Pathological tissue removed at operation is to be wrapped in gauze moistened with saline and sent immediately to the central laboratory, with complete clinical data.

(k) *Autopsies*: The central laboratory is to be notified by the registrar of a death occurring in a base hospital. The clinical brief is to be brought with the body to the morgue. The central laboratory will notify the adjutant of the time the autopsy is to be held.

It is desirable that the force in the central laboratory will be at all times as busy with laboratory activities as those of the subsidiary laboratories. For that reason the above outline of laboratory activities is to be looked upon as a tentative working arrangement.

If the officer of a subsidiary laboratory is at any time desirous of doing central laboratory work in his laboratory, the necessary material will be gladly furnished by the central laboratory.

(Memorandum No. 28, division of laboratories and infectious diseases, November 23, 1918.)

BACTERIOLOGICAL TECHNIQUE FOR INVESTIGATION OF PNEUMONIA

This technique and blank for tabulating findings (Form No. 11) have been formulated with the idea of obtaining sufficient uniformity in the results of different workers for them to be readily comparable.

It has been attempted to make the methods of examination as simple as possible so that very little extra work should be added to the usual routine bacteriological examination of autopsy material.

If it becomes the consensus of opinion that more detailed studies can be undertaken, the program may be enlarged accordingly.

There will no doubt be differences of opinion concerning the best culture media, proper technical methods, etc., to be used, and you are invited to make criticisms and offer any suggestion you may deem advisable.

In the meantime, however, you are requested to follow as closely as possible the program as outlined. Alterations which meet with general approval may be made subsequently

It is the intention to send out to each laboratory taking part in the investigation a monthly compilation of the reports received from all other participants. In this way, all may keep generally informed as to the progress and development of the undertaking.

A. AT AUTOPSY TABLE

1. Material necessary:

- (a) Alcohol or gas lamp.
- (b) Potato knife or similar instrument for searing surfaces.
- (c) Sterile swabs in individual test tubes.
- (d) Test tubes containing about 3 c. c. of nutrient broth.
- (e) Sterile pipettes.
- (f) Sterile slides.

2. Material from the following places will be examined:

- (a) Heart (blood).
- (b) Large bronchus, right and left lung.
- (c) Small bronchi, right and left lung.
- (d) Lung tissue, right and left side.
- (e) Accessory head sinuses and meninges which may show pathological process.
- (f) Pericardial and pleural cavities in case of involvement.

3. The heart's blood will be obtained as soon as the heart is exposed and before it has been opened. The surface will be seared and a sterile pipette plunged through the seared area into the heart cavity, at least 1 c. c. of blood withdrawn and transferred to a test tube.

4. The remainder of the material will be collected by means of tightly rolled cotton swabs. That from the lung tissues will be taken by first searing the cut lung surface and then forcing the swab through the seared area. Two smears from each swab will be made separately upon different slides. The slides will have been previously sterilized in the laboratory. This may be conveniently accomplished by wrapping them in paper and sterilizing in a hot-air oven. The swabs will then be put in the tubes containing the nutrient broth and taken to the laboratory for culture.

B. IN LABORATORY

1. *Microscopical examination of direct smears.*—One set of the smears will be stained with a weak aqueous fuchsin (one-fourth per cent saturated alcoholic solution of fuchsin in distilled water) and the other by Gram's method.

The weak fuchsin stain is selected because it is particularly satisfactory in demonstrating influenza bacilli.

The various morphological types of organisms will be noted and the relative proportion of each estimated.

It is of course obvious that the true nature of the organisms in many instances will be in doubt until cultural studies are completed, but by a comparison of the microscopic and cultural findings it should be possible to link them together and obtain an accurate idea of not only the identity of the organisms but also the approximate percentage of each.

The direct smears will be particularly important in determining the percentage and the cultures in working out the identification.

Cultures.—(a) Heart's blood: One loop full of the heart's blood will be spread on the surface of a blood agar plate and 1 c. c. inoculated into a tube containing at least 10 c. c. of calcium dextrose broth. (The blood agar will consist of a meat infusion agar having a reaction of plus 0.5 to phenolphthalein, to which is added 3 per cent of citrated or defibrinated blood. Human blood will probably be the most convenient to obtain. The broth will be a meat infusion broth, plus 0.5 to phenolphthalein and containing 1 per cent dextrose and 1 per cent calcium carbonate. It must be frequently agitated while tubing so that an equal distribution of the calcium carbonate is obtained.)

(b) The swabs will be stirred about in the broth, rolled over the sides of the tube to squeeze out the excess of fluid, and inoculated over a small area of a blood agar plate. Further spreading is accomplished by a bent wire or glass rod spreader. The importance of a uniform and well-distributed seeding over the plate in identifying *B. influenzae* and slow-growing streptococci can not be overestimated.

3. *Examination of primary cultures.*—(a) After incubation at 37° C. for 18 to 24 hours the plates will be ready for examination.

The different types of colonies on each plate will be studied and their relative numbers noted.

From all different types smears will be prepared and stained by Gram's method.

Subcultures will then be made as indicated.

(b) If no growth is obtained from the heart's blood inoculated upon the plate, a smear will be made from the broth culture and a loopful streaked upon a blood agar plate and further incubated.

4. *Methods of study and identification of organisms most likely to be encountered.*—(a) *B. influenzae* (Pfeiffer's bacillus) appears upon whole blood agar as minute pin-point, dewdrop-like colonies which are very likely to be overlooked unless searched for with a hand glass. They are more easily seen in reflected light.

If such colonies prove to be small Gram-negative bacilli, a diagnosis of *B. influenzae* is probably justified, but as further proof transplants may be made to plain and blood agar slants. Failure to grow on plain agar along with the other characteristics, is a distinguishing feature of the organism. In some instances, especially if there is an overgrowth of other organisms, the influenza bacillus may fail to develop, in which event opinion as to its presence will have to be based upon the microscopic examination of the direct smears.

Special media have been devised for its growth, but are not so satisfactory as whole-blood agar in distinguishing other organisms, and it has seemed advisable to attempt to select a single primary medium which would be generally adapted to the growth and differentiation of all organisms likely to be met with.

(b) *Streptococcus and pneumococcus group.*—At least one colony from all of the different appearing types of streptococci or pneumococci developing upon the blood agar plate will be transplanted to calcium dextrose broth (preparation previously described). After 18 to 24 hours' incubation the cultures will be examined microscopically and the following points noted: Size, shape, regularity, and chain formation. It is advisable to always save the plate until the following day so that if growth fails to occur in any of the transplants refishings may be made. Bile solubility test will then be performed by transferring with a sterile pipette 1 c. c. of the culture to an agglutination tube and adding 0.2 c. c. of clear ox bile. After incubating 20 to 30 minutes in water bath or 30 to 45 in incubator the results are read.

From those that are not bile soluble a subculture will be made into plain infusion broth, containing 5 per cent citrated or defibrinated blood, and after 16 to 18 hours' incubation the hemolytic effect will be noted. It is well to shake the culture after about 4 hours' incubation. It is very important that fresh blood be employed, and in all instances a control tube which has not been inoculated should be subjected to the same incubation.

Streptococci will be classified as hemolytic, nonhemolytic, streptococcus mucosus, and streptococcus viridans.

Hemolytic and nonhemolytic streptococci grow on blood agar as small white to grayish colonies. If hemolytic, the degree of hemolytic activity should be recorded as indicated on attached form.

Streptococcus mucosus (or *pneumococcus*) grow as rather large greenish colonies and may be hemolytic.

Streptococcus viridans appear as small green nonhemolytic colonies.

All bile-soluble cultures will be tested against pneumococcus types sera I, II, and III. There will usually be sufficiently heavy growth to use the broth culture direct. Utmost care should be used in withdrawing a portion of the culture to prevent agitation of the calcium carbonate, which will have settled to the bottom of the tube.

Strains of pneumococci which are not agglutinated by Type I, II, or III sera will be subcultured to calcium dextrose broth to which approximately 5 per cent of defibrinated blood has been added, and after 10 to 12 hours' incubation will be sealed, properly labeled with name of case and location from which culture was taken, and mailed to the central Medical Department laboratory.

Agglutination tubes containing about 2 c. c. of broth and 2 drops of blood will be found convenient for this purpose. To avoid the loss of strains a subculture of each organism

mailed will be retained until the notification of receipt at this laboratory has been received. Cultures in blood broth should remain viable for several weeks at room temperature after a short primary incubation.

(c) *Staphylococci*.—The hemolytic effect of the staphylococci should be noted upon the plates, and if any doubt exists it should be further tested in blood broth. The presence or absence of pigment will also be observed and classification made accordingly. It should be borne in mind that pigment frequently does not develop until 48 hours or more.

(d) *Gram-negative cocci*.—Transplants from colonies of Gram-negative cocci will be made upon Loeffler's blood serum medium or blood ether agar. From the transplants emulsions will be made in salt solution and set up against Rockefeller polyvalent serum 1 to 200 and normal rabbit or horse serum 1 to 100.

Subcultures upon brain medium of all strains agglutinated by the Rockefeller serum will be sent to the central Medical Department laboratory for typing.

The brain medium is prepared as follows: Brain (calf) run through meat grinder, 3 pints; distilled water, 1 pint; tube and autoclave (see office letter No. 30).

5. The necessary diagnostic sera will be obtained from the central Medical Department laboratory.

(Memorandum No. 37, division of laboratories and infectious diseases, February 9, 1919.)

Consolidated report of laboratory work accomplished in the American Expeditionary Forces during the month of January, 1919

Comprising 11 base-section laboratories, 16 hospital-center laboratories, 70 base-hospital laboratories, 26 camp-hospital laboratories, 22 evacuation-hospital laboratories, 2 mobile-hospital laboratories, 19 divisional laboratories, 3 water-analysis laboratories; total, 169. Number of deaths in hospitals, 948]

EXAMINATIONS MADE

I. Clinical pathology:

Blood—

Erythrocyte counts.....	1, 347
Leucocyte counts.....	7, 361
Differential leucocyte counts.....	4, 933
Hemoglobin estimations.....	1, 384
Malaria examinations.....	492
Positive examinations.....	34

Urine—

Urinalyses—	
Ordinary chemical.....	29, 976
Ordinary microscopic.....	20, 354

Feces—

For parasites and ova, examinations.....	745
Positive examinations.....	96
For Entamebæ examinations.....	395
Positive examinations.....	42

Sputum—

For tubercle bacilli, specimens.....	15, 165
Positive specimens.....	750
For other organisms.....	881
Positive specimens.....	508
Gastric contents, examinations of.....	165

Spinal fluid—

Smears for meningococci.....	831
Positive.....	286
Smears for other organisms.....	73
Cell counts.....	290
Globulin tests.....	228
Colloidal gold reactions.....	1

I. Clinical pathology—Continued.

Venereal specimens—

Smears for gonococci	6, 531
Positive	2, 548
Examinations for <i>T. pallidum</i> —	
Dark field examinations	1, 631
Positive	164
Stained specimens	453
Positive	70
Clinico-pathologic examinations not otherwise listed	1, 986

Total 95, 222

II. Anatomic pathology:

Operation specimens, macroscopic examinations	257
Autopsies performed	846
Histopathologic examinations	552
Museum specimens prepared	50
Photographs of wounds, specimens, etc.	506
Drawings of wounds, specimens, etc.	77
Anatomo-pathologic examinations not otherwise listed	286

Total 2, 574

III. Bacteriology (specimens examined culturally):

Blood, specimens of	1, 546
Urine, specimens of	607
Feces, specimens of—	
For dysentery	2, 048
Positive	29
For typhoid or paratyphoid	2, 983
Positive	263
Sputum, specimens of—	
For pneumococci	1, 383
Positive	653
Typed by Avery's method	702
Typed by mouse method	52
For other organisms	521
Positive	316
Nasopharynx, specimens from, for <i>B. diphtheriæ</i>	21, 542
Positive examinations	1, 972
For meningococci	5575
Positive examinations	508
Spinal fluid, specimens of	627
Positive examinations	174
Pus, exudates, etc. (exclusive of wounds)—	
Aerobic cultivations	816
Complete identifications (number of stains)	456
Anaerobic cultivations	228
Complete identifications (number of stains)	43
Wounds—	
Aerobic cultivations	1, 944
Complete identifications (number of stains)	498
Anaerobic cultivations	237
Complete identifications (number of stains)	34
Autopsies, Total original cultures from	983
Milk, total number of specimens of	86
Water, total number of specimens of	3, 595
Bacteriologic examinations not otherwise listed	2, 322

Total 48, 744

IV. Serology:	
Agglutination tests (with bacteria).....	2, 063
Bloods grouped (for transfusions).....	212
Wassermann tests—	
Blood.....	9, 265
Double plus, or plus.....	834
Spinal fluid.....	127
Double plus, or plus.....	25
Serologic examinations not otherwise listed.....	1, 453
Total.....	13, 120
V. Chemistry (specimens analyzed):	
Blood.....	174
Urine, special examinations.....	1, 568
Water.....	1, 280
Milk.....	3
Drugs, foods, beverages, etc.....	32
Chemical examinations not otherwise listed.....	64
Total.....	3, 121
VI. Operative procedures (by laboratory staff):	
Treatments with salvarsan.....	753
Treatments with therapeutic sera.....	839
Treatments with bacterial vaccines.....	1, 172
Schick tests.....	6, 260
Luetin tests.....	3
Animal inoculations.....	172
Operative procedures not otherwise listed.....	1, 925
Total.....	11, 124
Total laboratory examinations not included above.....	927
Grand total.....	174, 832

(Memorandum No. 38, division of laboratories and infectious diseases, February, 1919.)

THE MORE IMPORTANT FORMS USED IN THE LABORATORY SERVICE, A. E. F.

BACTERIOLOGIC RECORD

Ward..... Bed.....

Undercore terms which apply

Name..... Age..... No.....

Rank..... Organization.....

Date & hour of injury..... A.M.-P.M.

Date & hour of admission..... A.M.-P.M.

Date & hour of..... Initial..... Op..... A.M.-P.M.

secondary

Date of primary discharge..... Improved-Cured-Died

From Esc. Hosp. No..... Mobile Hosp. No..... Base Hosp. No.....

To Base Hosp. No..... Date of secondary discharge..... Improved-Cured-Died

On Stedion

BACTERIOLOGIST

Surgical Diagnosis

No. of Wounds.....

Summary of Treatment

General - decontamination Yes - No

Intusion - Yes - No. Character..... Am.....

Transfusion - Yes - No. Character..... Am.....

Serum Treatment - Type..... Am.....

Results..... Serum Sick 0-1-2-3

Local - Operative

Debridement - Partial - Complete

Foreign body removed Yes - No - 7 Number.....

Primary closure Yes - No - Drainage - Yes - No

Amputation - Yes - No - In depth of injury - In infection..... Simple Gas Bac

Delayed primary closure - Yes - No

Secondary closure - Yes - No

Treatment of wound before closure - Aseptic - Antiseptic

CLINICAL DATA

When feasible secure the following additional information

Local Lesions

Location of Wd..... Size 1-1-3

Description of Wd..... deep..... superficial..... lacerated..... penetrating..... perforated

Degree of contusion - 0-1-2-3 Degree of laceration 0-1-2-3

MISSILE - Bullet - Shrapnel Ball - Shell fragment - Hand Grenade - Bayonet - Knife

FOREIGN BODIES in Wd. - Yes - No Retained Yes - No - 7

LOCAL SIGNS OF INFECTION - Simple 0-1-2-3 - Gas Bacillus 0-1-2-3

Associated Lesions

BONE - FRACTURE OF..... Details penetrated Yes - No

Bone comminuted Yes - No

JOINT..... penetrated by missile Yes - No

Extension of fracture into joint Yes - No

VESSEL..... Contusion or Section of.....

Degree of impairment of vital circulation 0-1-2-3

BODY CAVITY..... penetrated - perforated

VISCERA INVOLVED.....

OTHER COMPLICATIONS.....

General - PHYSICAL DEVELOPMENT 1-3 STATE OF NUTRITION 1-3

EVIDENCES OF STAMPS LYMPHATICUS 0-1-2-3

GENERAL CONDITION on Admission - good - fair - poor

DEGREE OF SHOCK on admission - 0-1-2-3

HISTORY OF HEMORRHAGE - 0-1-2-3 VISIBLE BLEEDING 0-1-2-3

DEGREE OF ANAEMIA 0-1-2-3 CYANOSIS 0-1-2-3

DEGREE OF EXPOSURE 0-1-2-3 to wet - to cold

TEMPERATURE on Admission..... After Resuscitation

PULSE on admission - Rate..... quality.....

RESPIRATION on admission - Rate..... quality.....

EVIDENCES OF GASSING 0-1-2-3 Type.....

Autopsy - ANATOMICAL DIAGNOSIS

BACTERIOLOGIC EXAMINATION

Name of hospital.....

Negative of Wd.....

Summary of Bacteriologic Findings

MATERIAL FOR EXAMINATION

Debridement

Exudate secured - before - during - after..... Primary Suture

Delayed Primary

Secondary Suture

Character of Exudate.....

Tissue.....

Foreign Bodies - Missile..... Wood - Cloth - Bone

MICROSCOPIC EXAMINATION

Serum Treatment

CULTURAL EXAMINATION

Aerobic - Media & Method.....

Results

Anaerobic - Media & Method.....

Results

IDENTIFICATION OF STRAINS (complete + Incomplete -

Streptococcus Hemolytic Yes - No + -

Nonhemolytic Yes - No + -

Other Aerobes - Yes - No - Name..... + -

Aerobes - Yes - No - Name..... + -

BACTERIOLOGIC NOTES

Form No. 6

HISTOLOGIC EXAMINATIONS

RESULTS OF

PRIMARY CLOSURE - hours after injury..... Success

Failure

Partial Failure

CAUSE OF FAILURE

DELAYED PRIMARY CLOSURE - date..... Success

Failure

Partial Failure

CAUSE OF FAILURE

SECONDARY CLOSURE - Date..... Success

Failure

Partial Failure

CAUSE OF FAILURE

Ward..... Bed.....

NAME.....

MICROBIC CURVE CHART

Month.....

Day.....

Types of bacteria in wound

Number of bacteria in wound

Average No. of bacteria in wound

TREATMENT

RESULTS

ACCIDENTS

Remarks

SIGNS AND ABBREVIATIONS

Signs for entering types of bacteria in chart.

Streptococcus.....

Staphylococcus.....

Gram + bacillus.....

Gram - bacillus.....

Spore bearing bacilli.....

For Anaerobic Bac. add AA to Sign.

ABBREVIATIONS TO DENOTE DEGREE

0 = absent.

1 = slight or poor.

2 = moderate or fair.

3 = marked or good.

Other Abbreviations = use those employed in clinical records.

1081

MONTHLY STATISTICAL REPORT
SECTION OF WOUND BACTERIOLOGY

Name of Hospital (code No.) _____ Report covering period From 19__ to 19__

This form is designed for the use of a general surgical hospital. For head, chest and abdominal wound centers special forms will be issued. It is to be filled out in triplicate by the Wound Bacteriologist or his Statistical assistant. One copy is to be retained as the permanent record of the hospital organization from which the report is issued, the other copies are to be sent to the Director of Laboratories, A. E. F. and to the Director of the Surgical Service, A. E. F. respectively before the 15th of each month. In compiling this report all cases entering the Hospital during the preceding month should be included. Results of wound closures made during month covered by this report and known before the 10th of the following month should be included in this report. Other statistical evidence will be compiled from individual case reports and submitted to those concerned if information of practical value is revealed.

No.	%	No.	%	No.	%
1. Total number of Wounded		19. Secondary sutures based on cultural bacteriologic exams.		35. Wounds in which anaerobes and haemolytic streptococci were found in cases showing no evidence of gas bacillus infection	
a. Single		a. Failures		36. Wounds in which gas gangrene followed when both haemolytic streptococci and anaerobes were present	
b. Multiple		20. Secondary sutures made without previous bacteriologic exams.		37. Wounds in which anaerobes and haemolytic streptococci were found in cases showing a gas bacillus infection at time first examination was made	
2. Total number of Wounds		a. Failures		38. Wounds in which gas gangrene existed or followed in the absence of haemolytic streptococci	
3. Average time of arrival after injury in hours		21. Average time elapsing between incurrence of injury and primary suture		39. Blood cultures in cases of gas gangrene	
4. Wounds treated Surgically (Sublethals)		a. Aseptic treatment		a. Single exams	
5. Wounds Sutured		b. Antiseptic treatment		b. Multiple exams	
a. New Wounds		22. Average time elapsing between incurrence of injury and secondary suture		40. Cases in which anaerobes were isolated from blood	
b. Old Wounds from previous months		a. Aseptic treatment		a. In first examinations	
6. Unsutured Wounds		b. Antiseptic treatment		b. After two or more examinations	
a. New Wounds		23. Average time elapsing between incurrence of injury and secondary suture		41. Number of cases of gas gangrene	
b. Old Wounds from previous months		a. Aseptic treatment		42. Number of cases of gas gangrene in which B. welchii was the only anaerobe found	
7. Wounds evacuated before suture was attempted		b. Antiseptic treatment		a. Completely identified	
8. Unsutured Wounds disposed of because of death of cases		24. Total number of Wounds examined culturally		b. Partially identified	
9. Amputations		a. Aerobic cultivations		43. Number of cases of gas gangrene in which Vibrio septique was the only anaerobe found	
a. No. due to severity of injury		b. Anaerobic cultivations		a. Completely identified	
b. No. due to simple infection		c. Aerobic and anaerobic cultivations		b. Partially identified	
c. No. due to gas gangrene		25. Wounds in which Streptococci were found		44. Number of cases of gas gangrene in which B. edematiens was the only anaerobe found	
10. Primary Sutures		a. Microscopically		a. Completely identified	
a. Successes		b. Culturally		b. Partially identified	
b. Partial failures		26. Wounds in which haemolytic Streptococci were found (Percentage based on number of chainforming cocci tested)		45. Number of cases of gas gangrene in which B. sporogenes was the only anaerobe found	
c. Failures		27. Wounds in which nonhaemolytic chainforming cocci were found (Percentage based on No. of chainforming cocci tested)		a. Completely identified	
11. Primary Suture wounds reopened because of bacteriologic findings		28. Blood cultures in cases of simple infection		b. Partially identified	
12. Primary Suture wounds reopened because of Clinical findings (in which bacteriologic findings were superfluous or misleading)		29. Number of cases of Streptococcaemia		46. Number of cases of gas gangrene in which single species of anaerobes other than B. welchii were found	
13. Delayed Primary Sutures		30. Wounds in which anaerobes were found		a. Completely identified	
a. Successes		a. Microscopically		b. Partially identified	
b. Partial failures		b. Culturally		47. Number in which mixtures of were found	
c. Failures		31. Wounds contaminated with anaerobes but pursuing a favorable course (at no time showing evidence of gas bac. infection)		48. Number in which mixtures of were found	
14. Delayed Primary Sutures based on microscopic bacteriologic exams		32. Wounds contaminated with anaerobes in which gas bacillus infection developed		49. Number in which mixtures of were found	
a. Failures		33. Wounds in which gas bacillus infection was evident before bacteriologic examinations were undertaken		50. Number of cases of tetanus. (For each case a special report will be filled out.)	
15. Delayed Primary Sutures based on cultural bacteriologic exams		34. Wounds in which the discovery of anaerobes determined the course of treatment		51. Number of cases of tetanus associated with gas gangrene	
a. Failures					

52. **BACTERIA RESPONSIBLE FOR FAILURES FOLLOWING WOUND CLOSURES** (Fill in names of organisms held responsible for failures)

64. Primary Sutures								53. WOUNDS OF SOFT PARTS 55. Delayed Primary Sutures								56. Secondary Sutures							
				<i>(extra mass)</i>								<i>(extra mass)</i>											
No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%

[illegible]

62 Primary Sutures								63 Delayed Primary Sutures								64 Secondary Sutures							
				Excluded								Excluded								Excluded			
No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%

65. Results of Wound-Closures	66. Primary Sutures RESULTS					67. Delayed Primary Sutures RESULTS					68. Secondary Sutures RESULTS					69. Causes of Failures			
	a Total No.	b S	c PF	d F	e D	a Total No.	b S	c PF	d F	e D	a Total No.	b S	c PF	d F	e D	a St	b AA	c Other causes	d In- ter- nal
70. Wounds of Soft Parts.																			
a. Suture within 6 hrs. of injury.																			
b. — between 6-10 hrs. of injury.																			
c. — — 10-15 —																			
d. — — 15-24 —																			
e. — within 2 days of injury.																			
f. — — 4 —																			
g. — — 7 —																			
h. — — 14 —																			
i. — later than 14 days of injury.																			
j. Of face and scalp.																			
k. — Trunk.																			
l. — Extremities excl. of hands & feet.																			
m. — Hands.																			
n. — Feet.																			
71. Wounds of bone without complete Fracture. (Excl. of Skull & Spinal Column)																			
a. Suture within 6 hrs. of injury.																			
b. — between 6-10 hrs. of injury.																			
c. — — 10-15 —																			
d. — — 15-24 —																			
e. — within 2 days of injury.																			
f. — — 4 —																			
g. — — 7 —																			
h. — — 14 —																			
i. — later than 14 days of injury.																			
l. of Femur.																			
m. — Tibia & Fibula.																			
n. — Tibia.																			
o. — Fibula.																			
p. — Humerus.																			
q. — Radius & Ulna.																			
r. — Radius.																			
s. — Ulna.																			
t. — Bones of Hand.																			
u. — Bones of Feet.																			
v. — other Bones.																			
72. Wounds of joints.																			
a. Suture within 6 hrs. of injury.																			
b. — between 6-10 hrs. of injury.																			
c. — — 10-15 —																			
d. — — 15-24 —																			
e. — within 2 days of injury.																			
f. — — 4 —																			
g. — — 7 —																			
h. — — 14 —																			
i. — later than 14 days of injury.																			
k. of Hip.																			
l. — Knee.																			
m. — Ankle.																			
n. — Shoulder.																			
o. — Elbow.																			
p. — Wrist.																			
q. — other joints.																			
73. Wounds of Skull.																			
a. Without injury to dura.																			
b. With injury to dura and Brain.																			
74. Wounds of Spinal Col.																			
a. Without injury to Dura.																			
b. With injury to Dura and Cord.																			
75. Wounds of Pleura (only).																			
76. Wounds of Pleura & Lung.																			
77. Wounds of Pericardium (only).																			
78. Wounds of Pericardium & Heart.																			
79. Wounds of Peritoneum.																			
80. Wounds of Peritoneum & Abdom. Viscera.																			
81. Wounds of Kidney & Ureter.																			
82. Wounds of Bladder.																			
83. Wounds of Urethra.																			
84. Wounds of Genitalia.																			
85. Totals.																			

ABBREVIATIONS. — S = Successful closure. — P F = Partial failure - Partial reopening of wound necessary to control infection. — F = Failure - Complete reopening of wound necessary to combat infection. — D = Died. — St = Streptococcus. — A A = Anaerobic bacteria.

Chief Wound Bacteriologist.

REMARKS.

SPECIAL "GAS-GANGRENE" CARD

Combined Tetanus and Welch Bacillus Antitoxin

OFFICER ADMINISTERING SERUM

fill in following data.

Field Hospital No. _____

Dressing Station No. _____

Name _____
(Block letters)

Rank _____ No. _____

Regiment or Staff Corps _____

Combined tetanus and Welch bacillus antitoxin
administered on _____ 191at _____ A. M. _____ hours
P. M. _____
after injury._____
U. S. Army.
Form No. 9.SURGEON OPERATING, FILL IN FOLLOWING
DATA. CHECKING TERMS THAT APPLY

Field	} Hosp. No. _____	Walking	} Case
Mobile		Stretcher	
Evac.		Resuscitation	
Base			
DATE AND HOUR OF ADMISSION _____		A. M.	
DATE AND HOUR OF INITIAL OPERATION _____		A. M.	
		P. M.	

Local Signs of Infection

Simple, 0 - 1 - 2 - 3

Gas bacillus, 0 - 1 - 2 - 3

Nature of Initial Operation

Debridement	Partial	Primary closure	} Yes No
	Complete		

Foreign Body

Present	Yes	Removed	} Yes No
	No		

Amputation	Yes	for	degree of injury infection	Simple Gas bacillus
	No			

Diagnosis of Operating Surgeon.

Date of Evacuation following initial
operation _____Subsequent gas bacillus infection } Yes
No

Degree, 1 - 2 - 3

Recovery.

Death.

Autopsy.

INSTRUCTIONS TO ATTENDING
SURGEONS.

Notify bacteriologist in every case developing gas-gangrene or in which from the nature of the injury or the condition of the wound such an occurrence might reasonably be expected. Numerals 0 - 1 - 2 - 3 signify respectively absent, slight, moderate, marked.

LABORATORY OFFICER
FILL IN FOLLOWING DATA.

Names of anaerobes identified

Unidentified anaerobes	{	Present
		Absent
Streptococcus haemolyticus	{	Present
		Absent

INSTRUCTION TO BACTERIOLOGIST.

In those cases developing gas-gangrene the bacteriologist should be guided by instructions given in Memorandum No. 24, Div. Labor., "Prophylactic Serum Treatment against Gas-Gangrene".

DISPOSITION OF THE CARD. — This card must accompany patient, and should be placed in envelope with Field Medical Card. After the completion of the case (recovery or death) this card and all other laboratory records should be sent to the Director of Laboratories, A. E. F., A. P. O. 721.

REMARKS.

SPECIAL "GAS-GANGRENE" CARD

TETANUS ANTITOXIN ONLY

OFFICER ADMINISTERING SERUM

fill in following data.

Field Hospital No. _____

Dressing Station No. _____

Name _____
(Block letters)

Rank _____ No. _____

Regiment or Staff Corps _____

Tetanus antitoxin administered

on _____ 191
 at _____ A. M. _____ hours
 P. M. _____
 after injury.

U. S. Army.

Form No. 9.

SURGEON OPERATING, FILL IN FOLLOWING
DATA. CHECKING TERMS THAT APPLY

Field	} Hosp. No. _____	Walking	} Case
Mobile		Stretcher	
Evac.			
Base		Resuscitation	

DATE AND HOUR OF ADMISSION _____ A. M.
 _____ P. M.
 DATE AND HOUR OF INITIAL OPERATION _____ A. M.
 _____ P. M.

Local Signs of Infection

Simple, 0 - 1 - 2 - 3
 Gas bacillus, 0 - 1 - 2 - 3

Nature of Initial Operation

Debridement	Partial	Primary closure	Yes No
	Complete		

Foreign Body

Present	Yes	Removed	Yes No
	No		

Amputation	Yes No	for	degree of injury	Simple	infection	Gas bacillus

Diagnosis of Operating Surgeon.

Date of Evacuation following initial
operation _____

Subsequent gas bacillus infection } Yes
 } No

Degree, 1 - 2 - 3

Recovery.
 Death.
 Autopsy.

LABORATORY OFFICER
FILL IN FOLLOWING DATA.

Names of anaerobes identified

Unidentified anaerobes	{ Present Absent
Streptococcus haemolyticus	
	{ Present Absent

INSTRUCTIONS TO ATTENDING
SURGEONS.

Notify bacteriologist in every case developing gas-gangrene or in which from the nature of the injury or the condition of the wound such an occurrence might reasonably be expected. Numerals 0 - 1 - 2 - 3 signify respectively absent, slight, moderate, marked.

INSTRUCTION TO BACTERIOLOGIST.

In those cases developing gas-gangrene the bacteriologist should be guided by instructions given in Memorandum No. 24, Div. Labor., "Prophylactic Serum Treatment against Gas-Gangrene".

DISPOSITION OF THE CARD. — This card must accompany patient, and should be placed in envelope with Field Medical Card. After the completion of the case (recovery or death) this card and all other laboratory records should be sent to the Director of Laboratories, A. E. F., A. P. O. 721.

Form No. 16.

GSW Card No. _____

Classification: Anatomic location of major wound _____

Group _____

Identification: Surname _____ Christian _____

Rank _____ Co _____ Organization _____

Age _____ Race _____ Service _____

Aut. No. (CMDL) _____ Aut No. (Orig.) _____ Hosp _____

Pathologist _____

(1) No. of wounds:

Single _____ { Penetrating _____
 Nonpenetrating _____
 Multiple _____ { Penetrating _____
 Nonpenetrating _____

(2) Location:

Major wound _____

Minor wounds _____

(3) Missile:

Shell fragment _____ { Shrapnel _____
 High explosive _____
 Grenade _____
 Rifle bullet _____ { Shrapnel ball _____
 Machine gun _____
 Rifle _____

Side arms _____

(4) How received:

In action (I. A.) _____

Accidental (Acc.) _____

Self inflicted (S. I.) _____

Homicidal (H) _____

Judicial (J) _____

(5) Battle area:

(6) Date wounded _____

(7) Date of death _____

(8) Duration of life _____

(9) Wound to first operation _____

(10) First operation _____

(11) First operation to subsequent _____

(12) Subsequent operations _____

(13) Clinical course _____

(14) Bacteriology:

Wound—

Part ident. _____

Compl. ident. _____

Blood—

Part ident. _____

Compl. ident. _____

(15) Cause of death: (clinical diagnosis):

Principal cause _____

Contributory causes _____

(16) Hospitals through which patient passed:

(17) Location of major wound _____

(18) Groups:

Group A (gas gangrene).

Group B (other factors with gas

gangrene).

Group C (pyogenic sepsis).

Group D (tetanus).

Group E (miscellaneous).

Group F (GSW, no connection

with D).

(19) Primary immediate cause of death:

(20) Secondary lesions:

(21) Historical landmarks:	(26) Bacteriology
.....	Wound—
.....	Part ident
.....	Compl. ident
(22) Principal bones injured	Blood—
.....	Part ident
.....	Compl. ident
.....	(27) Cause of death (anatomic diagnosis):
(23) Large blood vessels injured	Primary immediate cause of death ..
.....
.....	Secondary lesions
.....
(24) Internal organs injured	Historical landmarks
.....
.....	(28) Opinion of pathologist (as to diagnosis,
(25) Nervous system injured	and medical treatment,)
.....
.....
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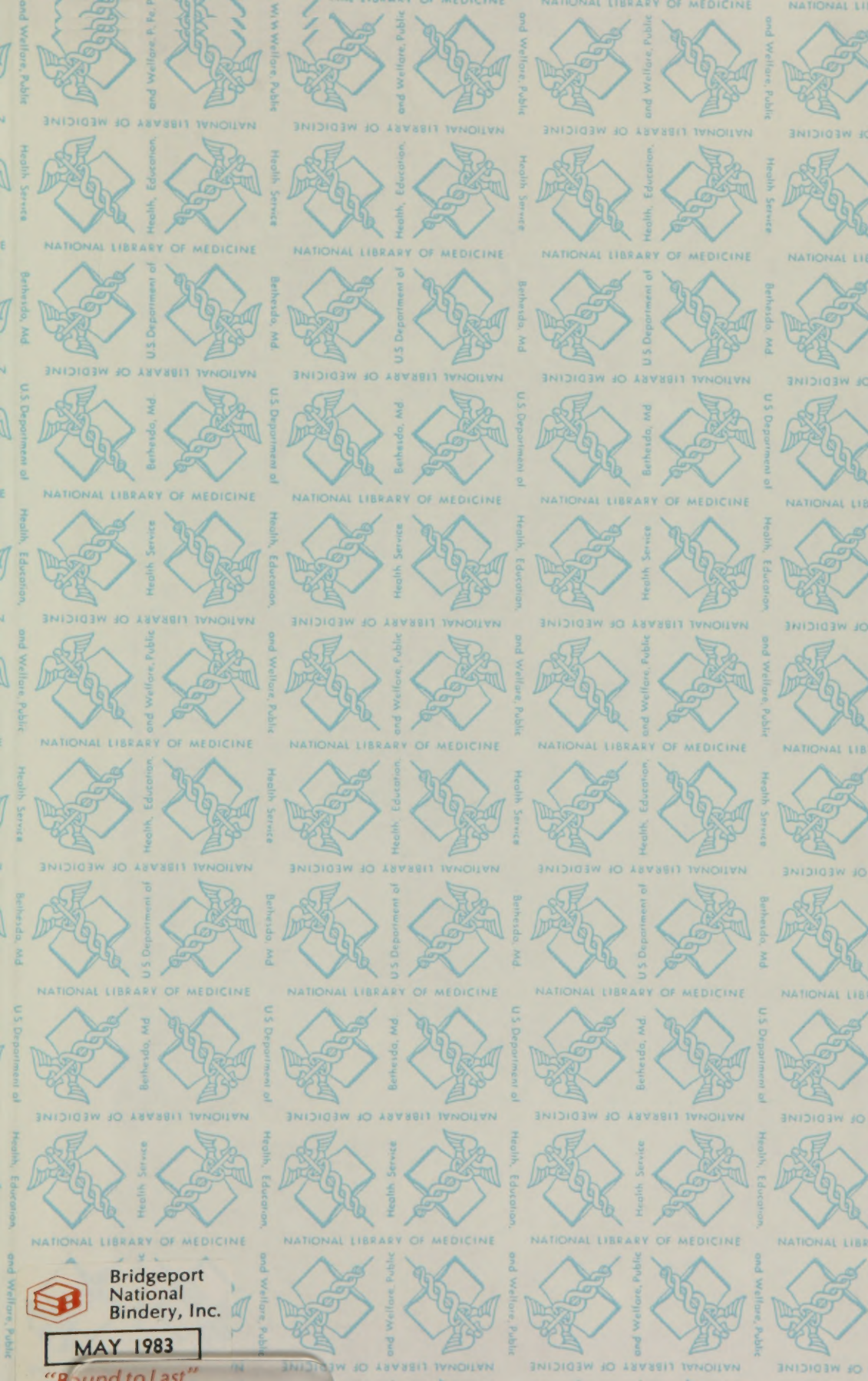
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